

Digging for *Rezeki*, Sidestepping *Bala*:
Health Risks, Perceptions, Amelioration
in Bombana Gold Mining, Eastern Indonesia

By
Fitrilailah Mokui
(u4552939)

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Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of the author's knowledge, it contains no material previously published or written by another person except where due reference is made in the text.

Fitrilailahh Mokui [signature]

February 2023

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Abstract

Bombana in Southeast Sulawesi has been experiencing a 'gold rush' since 2008, and thousands of miners, including migrants and local people, engage in risky small-scale mining practices daily despite messaging from local media and government health and environment agencies emphasizing the risks of gold mining to humans and the environment. This thesis analyses people's reasons for mining, their (risky) mining practices, local risk perception and people's strategies for ameliorating risks. It is an ethnographic study of the work and life of mining settlements in Bombana, based on medical anthropology and cultural epidemiology. The thesis investigates mining work and its economic and environmental impacts from the point of view of miners (locals and migrants; men and women; and the children of mining families).

In Bombana gold mining, people deploy their traditional cultures, identities, social relations, gender relations, morality, norms and values in their mining and family lives. They justify their engagement in mining, the choice of small-scale mining methods, and interpret what is risky and non-risky, to conduct their livelihoods. They draw on customary beliefs and practices to identify and ameliorate those risks.

The concept of *rezeki* (livelihood, luck, fortune understood as a gift from God) is a powerful motive for miners. *Rezeki* encompasses economic motivation (culturally defined) and religious rationale. It expresses morality based on religious ideas, particularly Islamic values regarding the conduct of worship (*ibadah*) and struggling for life (*jihad*). These religiously inflected motives keep people going to mine even though they risk their lives in the deep 50-metre shafts and often get no returns in a day. Their religious calculation that God (Allah) will intervene in their *rezeki* underpins their economic calculation of mining. People express religious values by working hard (*berusaha*) along with supplication (*berdoa*) to optimise their *rezeki*. Yet, they also always expect to encounter *bala* (disaster/risks), which can also carry the sense of being given by God). I explain this customary and religious concept of risk, which reveals what they perceive as 'health risks'. Their perception of risks encompasses a comprehensive set of adverse health impacts, and negative impacts on the broader concept of human health, including physical, psychological, mental, social, and environmental.

Everyday lives are entangled in *rezeki* and *bala*. To attain and retain *rezeki* and avoid *bala*, the Bombana miners and their community believe they should maintain good morality and perform ameliorative rituals based on traditional culture and Islamic religion, and, notably, migrants tend to adopt the Moronene rituals to ameliorate mining risks. We can understand these traditional concepts as strategies for understanding risk management.

These traditional and religious concepts are examined alongside the government approaches to risk management in small-scale gold mining. I found the understanding of the issues and the advice that officials gave to communities was often based on ignorance and also often contradictory between different agencies. A further complication is that perceptions of health risks and strategies for risk management remain fluid in the community, and I show they can be understood through, for example, gender and sociocultural lenses.

The contribution and implications of my study relate to how we can achieve successful public health and social interventions and outcomes for mining communities. I argue that to communicate successfully to the community, policymakers and staff of health and environment agencies consider laypeople's perceptions and language of risks rather than deploying a uniform fixed format of risk management to address the pressing health, social and environmental issues.

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Notes on Writing Style

1. QUOTES:

Single inverted commas ('...') are used to cite authors' written works and highlight the interview notes. If quotation marks are needed inside the single commas, double inverted commas are used instead of single ones. Square brackets ([...]) are used when adding some words to a quotation.

2. NUMBERS: Numbers zero to nine are spelt out, and for numbers 10 and over, numeric symbols are used.

3. NON- ENGLISH WORDS:

Indonesian words are spelt according to the official convention of the Republic of Indonesia (*Ejaan Yang Disempurnakan*, abbreviated as *EYD* or the Perfected Spelling System, published by the Balai Pustaka 1972). These words and their abbreviations are written in italics.

Original written languages are cited without any change from the referred sources, and the language needs to be changed to the Indonesian style. Buginese, Moronene, Sundanese and Arabic words are written in italics with the name of the language in brackets in full or abbreviated, also in italics: for instance, *Buginese(B)*, *Moronene(M)*, *Sundanese(S)*, and *Arabic(A)*. However, the writing will follow the Indonesian style without diacritic symbols.

Arabic words are written in Indonesian without diacritic symbols, such as *rizk* (A), spelt as *rezeki*.

I do not add 's' for some words in plural forms in Indonesia, Buginese and Moronene, for instance, *Imam* and *Mokole (M)*, since the words may be singular or plural.

4. I used N.J. Dawood's The Koran, 2006, for the Qur'anic verses.

5. Main section headings are in bold, and the subsections are in capitals but not bold.

6. I used averaged currency between my period research time in between 2014 and 2015 that fluctuated between 1AUD= nine thousand and nine hundred rupiahs and 1AUD=ten thousand and one hundred rupiah, which was 1AUD= ten thousand rupiahs.

Abbreviations and Glossary

Abbreviations

ABRI	Angkatan Bersenjata Republik Indonesia
Allah SWT	Allah Subhanahu Wa Ta'ala
AMDAL	Analisis Mengenai Dampak Lingkungan
B3	Bahan beracun dan berbahaya
Babinkamtibmas	Balai Bina Keamanan dan Ketertiban Masyarakat
Babinsa	Bintara Pembina Desa
BLH	Badan Lingkungan Hidup
BNN	Badan Narkotika Nasional
BP-POM	Balai Pengawasan Penggunaan Obat dan Makanan
Brimob	Brigade mobil
CSDH	Commission on Social Determinants of Health
CSR	Corporate Social Responsibility
Dinkes	Dinas Kesehatan
Distamben	Dinas Pertambangan dan energy
ILO	The International labor organization
Jatam	Jaringan tambang
K3	Kesehatan dan Keselamatan Kerja
Kemenag RI	Kementrian Agama Republik Indonesia
KHA	Konvensi Hak Anak
KPPPA	Kementerian Pemberdayaan Perempuan dan Perlindungan Anak
KTP	Kartu Tanda Penduduk
KTT	Ketua Teknik Tambang
LAHA	Lembaga HIV/AIDS
Narkoba	Narkotika dan obat terlarang
NGO	Non-Government Organization
PAD	Pendapatan Asli Daerah
PAUD	Pendidikan Anak Usia Dini
Pekat	Penyakit masyarakat
Perda	Peraturan Daerah
PLM	Panca Logam Makmur
PNPM	Program National Pedesaan Mandiri
Posyandu	Pos Pelayanan Terpadu
Puskesmas	Pusat Kesehatan Masyarakat/Puskesmas
Pustu	Pusat Pelayanan Terpadu
Raskin	Beras Miskin
Sekolah Satap	Sekolah Satu Atap
SD	Sekolah Dasar
SDH	Social Determinants of Health
SMA	Sekolah Menengah Atas
SMP	Sekolah Menengah Pertama
SP	Satuan Pemukiman
STIK	Sekolah Tinggi Ilmu Kesehatan Masyarakat
SWT	Subhanahu Wa Ta'ala
TK	Taman kanak-kanak
Tupoksi	Tugas pokok Dan fungsi

UKK	Unit Kesehatan Kerja
UPTD	Unit Pelaksana Teknis Daerah
UU	Undang-Undang
WHO	World Health Organization

Glossary

Adat : Local customary law, especially of Islamic-Malay tradition in Indonesia.

Air raksa, air keras, air perak: Local terminologies of mercury.

Allah Subhanahu Wa Ta'ala (SWT): Allah the only God in Islam

Amalgamation: A process of binding gold with mercury to form an amalgam.

Amdal stands for *Analisis Mengenai Dampak Lingkungan*: Environmental Impact Analysis.

Amphetamine: A medicine that has a stimulant effect on the human' central nervous system that can be both physically and psychologically addictive when overused. According to Kramer, Fischman, and Littlefield (1967, p.305), the abuse of amphetamines will have impacts such as someone will not sleep for five days, gradually becomes paranoids, disorganized and lethargic.

Badan Lingkungan Hidup/BLH : Local environmental agency

Badan Narkotika Nasional/BNN: National Narcotics Agency

Bahan beracun dan berbahaya/B3: Hazardous and toxic materials

Bahan berbahaya/B3: Dangerous goods

Balai Bina Keamanan dan Ketertiban: Security and Order Development Center-Police Office

Balai Pengawasan Penggunaan Obat: the Centre for Drug and Food Control

Beras Miskin/Raskin: Free rice for the Poor Program from the Social Department. It is a national program to subsidies rice for the poor villagers or sells rice at low prices.

Berbeda-beda tetapi satu: Unity in diversity (It is the official the national motto of Indonesia).

Bidan: Midwife. Village midwives (*Bidan desa*) are called by midwife tittle such as Rosmiati, Bidan Ros.

Badan Pusat Statistik /BPS Bombana: Central Bureau of Statistics

Brigade mobil (Brimob)/Korps Brigade Mobil is The Mobile Brigade Corps that do special operations, paramilitary, and tactical unit of the Indonesian National Police (Polri).

Bupati: Head of the district

Cada: Cadari or face-veil

Cerra: Means to purify any vehicles, machine or equipment used for consumerism and business with the intention of getting more *rezeki* and sidestepping the *bala*. This stage can be done through rituals such as thanksgiving (*syukuran*) or *mooli* (M).

Cuci karpet: Carpet washing. The stage is when miners wash the carpets inside the tailing hole. Male miners used the *Dompeng* machine, sucking mud and sifting the mud across a piece of carpet. The carpet is used to sieve the gold, which is placed on a sluice box. It is the last process of the day for *Dompeng* machines.

BP-POM: *Badan Pusat-Pengawasan Obat dan Makanan (BP-POM)* is an Indonesian government agency to control and regulate medicine (and other chemical substances) and to issue license for food industries/product including mercury. The only company credited with distributing mercury in Southeast Sulawesi.

Dhuhr: Praying time during mid-day praying at around 12 pm-3pm

Dinas Kesehatan/Dinkes: Public Health Department

Dinas Pertambangan dan energy/Distamben: Local mining and energy department

Dokter ahli kulit: Dermatologist

Dompeng: It is adapted from the name of a famous Chinese brand of sluice machine called *Dong Feng*.

Dompeng holes: are the area where miners used to dig mining materials and channel water. From the *dompeng* hole, miners use *dompeng* machine to suck and to irrigate muddy water rich materials on the carpet of the kato/sluice box.

Dukun: Traditional healers

Dupa: It is a smoke medium for the imam to communicate with God and spirit possessions. Some people make *dupa* from burning sugar on a plate filled with charcoal to produce smoke. People believe smoke can invite the spirit and their ancestors to join the rituals and enjoy the feasts provided.

Hadits: It is the sayings and practices of the Prophet Muhammad

Halalan thayibah(A)/Halal dan baik: Halal and good

Hydragirium (Hg): Chemical name of mercury

Imam: A religious leader who typically looks after the local mosque.

Jatam/Jaringan advokasi tambang: It is “is a network movement whose components consist of a village node, regional/island node, national node, a regional board and a support body. Each node possesses autonomy for managing it’s own network”. (www.jatam.org/en/organization)

Jilbab: Veil

Karma: means, the consequences of behaviour of what goes around comes around. *Bala* can include *karma*.

Karma means, the consequences of behaviour of what goes around comes around. *Bala* can include *karma* (see chapter 2 about *bala* and *rezeki*).

Kartu domisili: Domicile card

Kartu penduduk: Identity card

Kementrian Pemberdayaan Perempuan: The Ministry of Women Empowerment and Child Protection

Kepala Seksi B3: Dangerous Goods head Section

Kesehatan dan Keselamatan Kerja/K3: Occupational health and safety

Kesehatan Lingkungan: Environmental health

Ketua adat: The *adat* leader recognised in a community.

Ketua Teknik Tambang/KTT: The head of Mining Engineering

Komba-komba: It is a shrub growing wild along the road to the mining sites; these plants can also be used as traditional medicine.

Kompas Gas Gratis: Free Gas Stove

Konvensi Hak Anak/KHA: Child right convention. Indonesian Government Laws on Children, Rights Convention

Lubang tikus: Rat hole. It is a local term for a gold shaft. The shaft can be dug in vertical or horizontal directions. Most main shafts are dug vertically, and the horizontal shaft can be dug inside the main shaft.

Lurah : Village head

Maghrib : Praying time in the afternoon at around 5.30 pm to 7.00 pm when moslems in Bombana are expected to do Maghrib prayer at that time.

Marempel: A process of crushing rocks into fine materials, drying the wet crushed rocks on a hot sunny day, sifting the crushed rocks with a hand sieve, and then resifting the material, making it ready for panning.

Masyarakat /Babinkamtibmas: Center for Public Order and Safety Development.

Matoyong: Local term for the process of amalgamation when fine materials and mercury liquid are sieved onto plastic fine cloths and squeezed to form a ball/a nugget of amalgam.

Mesin dompeng: Means a *dompeng* machine or tractor machine as the same as the Chinese brand *Dong Feng*.

Minuman Beralkohol : Alcoholic beverages

Moronene: Indigenous people in Bombana

Narkoba: Refers to narcotics (*narkotika*) and illegal/forbiden drugs (*obat terlarang*). This term is well known as *penyalahgunaan narkotika dan obat terlarang/narkoba*) and this is considered in Bombana society as another form community disease. It is a silent problem prominent among Bombana miners.

Nteiwonua (M): The guardian spirit of nature

Ojek: it is motorcycle taxi which mode of transportation, it is the only cheap transportation mode operated by an individual, which is available for parents and pupils in the mining sites.

One *kaca*: Equals 1/10 gram= 0.1 gram

Operasi Penyakit masyarakat/operasi Pekat: Police operation to combat social issues such as gambling, prostitution, drug abuse, etc.

Orang local/orang asli Bombana: Anyone who was born and lived for a long time in Bombana from various ethnic backgrounds.

Pak Desa: This is a familiar and respectful way of addressing and referring to the village headman. During my research period, this is a common name for Rais, the head of Rau-rau village in 2014-2015 during my research period.

is a term that means taboo or prohibited based on adat/tradition and social convention, habit and custom. *Pemali* means behaviour/thinking/attitude that is not allowed.

,
Penanggung jawab: Responsible person, which means someone who manages the daily operations in mining sites.

Pendapatan Asli Daerah/PAD: Local revenue.

Pendidikan Anak Usia Dini (PAUD): Early childhood education

Pengawasan dan Pengendalian Minuman beralkohol: Supervision and control of alcoholic beverages.

Penyakit masyarakat: Community/social issues related risk-taking behaviour such as drug use, prostitution, gambling, alcohol abuse, etc.

Peraturan daerah or Perda: Local regulations

Perlindungan anak: Child Protection

PNPM-Mandiri Pedesaan: Program-Rural Independent

Pos Pelayanan Terpadu/Posyandu: Maternal and child health posts are held monthly in each village. Collaboratively run by the village women's organization PKK and *Puskesmas* officers and women volunteers. The post can be held in *Puskesmas* yard or villagers' front yards of their houses.

Integrated (health) service centre. The *pustu* is located in every village and where the village nurses live. The village does not have a *Puskesmas*.

Program Nasional Pengembangan Masyarakat: National Community Development Programs
Program Simpan Pinjam Perempuan: Saving and Credit programs for women

Pusat Kesehatan Masyarakat/Puskesmas: Community Health Centre/Community health service.

Rumah sakit Bombana : Bombana hospital

Sekolah Dasar (SD): Primary school (year 1-6)

Sekolah Menengah Atas (SMA): Senior High School (year 10-12)

Sekolah Menengah Pertama (SMP): Junior High School (year 7-9)

The *SATAP*: abbreviation for *Sekolah Satu Atap*. This means a one-roof education system. The *SATAP* integrates primary school (*Sekolah Dasar/SD*) and secondary/junior high school (*Sekolah menengah pertama/SMP*) in one physical school location.

Sekolah Tinggi Ilmu Kesehatan Masyarakat/STIK: College of Public Health Science

Sembako: an abbreviation for nine basic needs (*Sembilan Bahan Pokok*) consisting of food and drink, officially listed as the primary needs Indonesian people.

Shabu/shabu-shabu: They are local terms for amphetamine

Simpang/Palang: *Simpang* means the three junctions in the main road of Rau-Rau village. The *palang* means this place used a crossbar on the gate to enter the mining sites.

Suster/Perawat: Nurse. Village nurses (*Perawat desa*) are called by their nurse title, such as *Suster Sukma*.

Taman kanak-kanak (TK): Interchangeably used for preschoolers and Kindergartens

Terpal biru/tenda biru: Blue tarpaulins/blue tent

Toko kelontong: Grocery stores

Tolea (M): An *adat* leader. A *Tolea* has a knowledge and skills to lead the traditional rituals of Moronene such as Mobeli Wonua, Mooli, etc.

Transmigrasi: A national program to relocate local people from densely populated areas mainly Java island and Bali to less populated areas, mainly rural areas in Indonesia, organised by central and local government. People who are relocated are called *transmigran* or *orang trans* (trans people).

Tugas pokok Dan fungsi/Tupoks: Job descriptions

Undang-Undang(UU) Perkawinan: Indonesian National Marriage Law

Unit Kesehatan Kerja/UKK: Occupational Health Unit Program

Wadal (S): This is a Sundanese word that means sacrificial objects.

Warung: Grocery stall

Chapter One

Introduction



Figure 1.1. Mining activities behind the kitchen and around a house in Wumbubangka village.

Bombana is a new mining area in Southeast Sulawesi, Eastern Indonesia. The dynamics, regulations, and nature of work distinguish it from other small-scale mining areas in Indonesia (Aspinal, 2001). During my fieldwork in early August 2014 in Bombana, I identified the initial questions that I needed to answer during fieldwork:

1. How do they practice mining?
2. How do they perceive the risks involved in their activities?
3. Why do people become involved in the risky activities characterising Bombana small-scale mining?
4. How do they ameliorate those risks?
5. How are their perceptions of risks and benefits influenced by social structures, social relations, gender relations, norms, culture, and values?

In this thesis, I will use the term small-scale gold mining to describe all kinds of mining activities (see the next section about studies of small-scale mining in Indonesia).

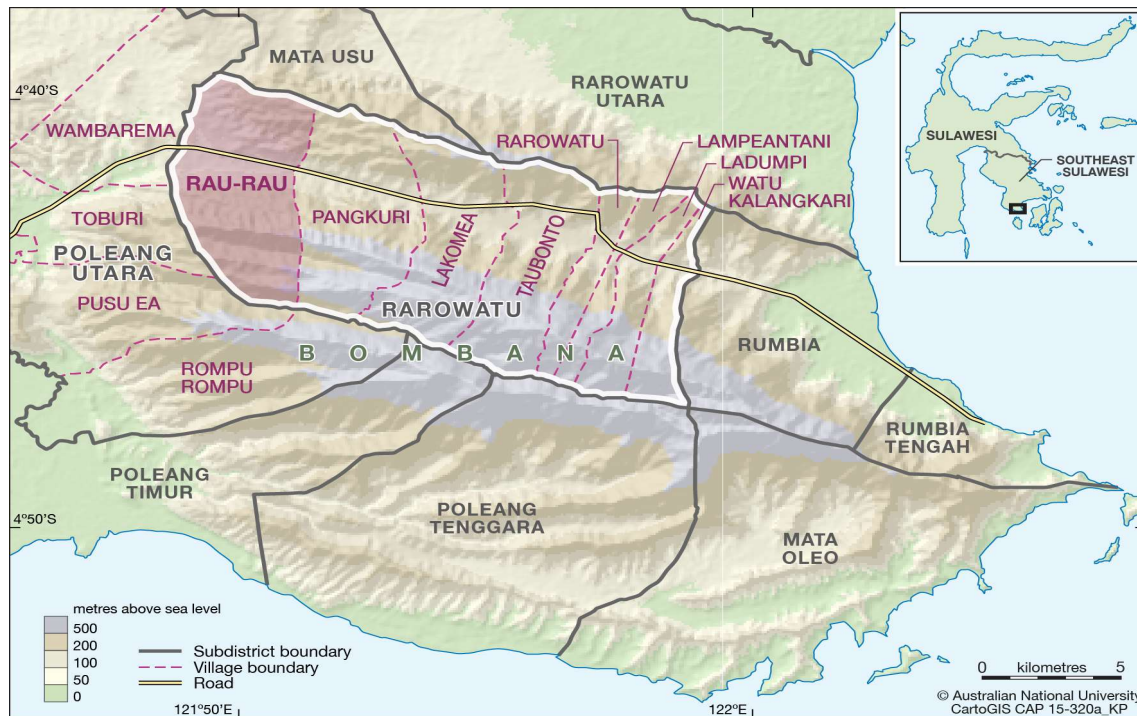


Figure 1.2. Map of Rau-rau, Rarowatu sub-district, Bombana district, Southeast Sulawesi. Reproduced from CartoGIS, College of Asia and the Pacific, Australian National University.

On the 2nd of August 2014 on my initial visit to Bombana mining, I observed many wide, deeply excavated holes and narrow manually dug holes in the backyards of most houses in Wumbubangka village of Bombana district. Samsuddin, a local miner informed me that Bombana people are very lucky because he can dig holes to find *rezeki* ('good fortune'-the colloquial way they refer to the gold) at the back of his kitchen. When I visited the inner part of the village, I also saw massive, excavated holes, looking like a green lake, near the paddy fields. Some villagers informed me that the gold mining company PT.SUN, who had the mining concession for that area, had failed to backfill these large excavations.

For the Moronene people of Bombana, gold is a familiar commodity: they have been using it in transactions and exchange and as savings since the late 19th century (De Jong, 2011). For example, according to some informants, they have long used gold as bridewealth in marriage rituals. Gold is respected as a valuable commodity in the community, and so, when gold was discovered there in 2008 (see the gold rush section), there was a strong response, leading to huge changes that occurred.

This thesis examines local constructs such as *rezeki* (good fortune) to understand people's motivations to find gold (See chapter two about *rezeki*). According to a scholar from the Indonesian Institute of Science, Zulkarnain (2010), most farmers became miners at the new mining sites to sustain their livelihoods. *Rezeki* - a construct adapted from Islamic values -

underlies people's motivation to mine gold and sustain their livelihoods (Zulkarnain, 2010). People recognised that they could earn quick cash from mining activities that do not require skills (Zulkarnain, 2010, p.11). People were interested in mining to alleviate the community's poverty (Pudjiastuti, 2010; cited in Zulkarnain, 2010, p.11).

As well as this positive response, this thesis also investigates local perceptions of negative impacts and risks of mining activities. While gold mining has been positively perceived as benefiting economic growth for the Bombana local people, some national and local media highlight the risks of mining activities. The national metropolitan daily newspapers such as *Kompas* and *Republika*, as well as local newspapers such as *Kendari Pos* and *Kendari Express*, quickly raised concerns regarding negative impacts on human life and the environment from intensive mining activities. Issues raised included the environmental damage around the main river in Rau-rau village of Bombana, Tahi Ite riverbanks. (Pudjiastuti, 2010 cited in Zulkarnain, 2010, p.11) Zulkarnain (2010) noted a deterioration in the environment along the Tahi Ite River. Initial research regarding mercury contamination in Bombana was conducted by Trisnawaty, Emiyarti and Afu (2013).

However, the media and researchers' perceptions differ from the local people's perceptions. Bakri, a local miner (see chapter four regarding mercury) has a different perception from the scientific/medical community regarding mercury risks. He perceives that *air raksa*, the local term for mercury, is safer than *merkuri*, another scientific term for mercury in Indonesian. I met a mother with her five-year son, Ahmad (see chapter six regarding children in mining) who told me that she operated a winch for her son to go more than 15 metres down a mining shaft, locally called a rat hole (*lubang tikus*), so he could transport gold-bearing soil dug out by his father and seven-year-old brother. Their stories are evidence of how people become involved in the risky activities in Bombana gold mining.

This thesis investigates the motivations of Bombana people to mine gold and in particular their perceptions of the risks of their mining activities. I also explore the local livelihoods mining methods practised in Bombana. Local motivations and perceptions of risk differ from those of government, media and people' perceptions differ according to social, political and cultural factors., including gender differences. In my investigation of local perceptions of motivation to find gold and the mining risks I have drawn on medical anthropology and cultural epidemiology.

The Tale of Goldrush in Bombana

A gold rush began in September 2008 when Budi, a local farmer, revealed that he had found an abundance of gold in Bombana. He started prospecting for gold in the Tahi Ite River after receiving a message from God in a dream telling him to pan for gold in his village, Raurau. As he had experience as an artisanal gold miner elsewhere in Indonesia, he quietly started to pan for gold and reportedly collected a large quantity. When he sold a significant amount to a trader in town, the buyer initially suspected him of theft and reported him to the local police. The police interrogated him and hence his secret became public knowledge.

The local newspaper, the *Kendari Pos* (Era/Ong, 2008) splashed the news across its pages, and the national media (*Kompas.com*, 2008a) picked up the story, suggesting that there were rich prospects in Bombana and that locals along the rivers could mine it freely. News quickly spread across Indonesia that the Bombana district was rumoured to have 165,000 tons of gold deposits of very good quality. Thereafter, Bombana became known in media as the land of gold (*tanah emas*) and the land of golden destiny (*negeri berberkah emas*).

To control the huge numbers of people who moved into Bombana district during the gold rush, the local government established licences. In late October 2008, two months after Budi discovered gold, the Bombana District Head issued a Decree (*Surat Keputusan Bupati*) No. 10/2008 requiring miners to possess a license to enter the mining area (*Kartu Izin Masuk Penambangan/KIMP*). In November 2008, the District head announced the establishment of a People's Mining Area (*Wilayah Pertambangan Rakyat/WPR*). Around late November, the Regent (*Bupati*) also secretly issued a decree (*Surat Keputusan Bupati*) No. 353/2008 licensing a national company, PT. Panca Logam Makmur (PT. PLM) to mine gold in Wumbubangka village, North Raruwatu sub-district- a former transmigration area (*lahan transmigrasi*) of 1,200 ha; the area allocated for a national program called *transmigrasi* (see chapter 2 and abbreviation).

In December 2008, the local government withdrew the licenses for PLM and KIMP and issued replacement licenses with local regulations (*Peraturan Daerah/Perda*) No. 20/2008. There was no information regarding why the *Bupati* issued and changed the licences for those mining companies.

In January 2009, a new *National Mining Law No. 5/2009* was enacted. Under this regulation, although the district government had withdrawn the PLM license the previous month, a different sort of license was issued, enabling the company to continue its mining

exploration in Bombana and to stop all individual mining activities. Following the revised regulation, most miners joined the small-scale mining companies, such as PLM, to be called legal miners and be allowed to mine in the concession areas of mining companies. Every legal miner was given a mining card that had allowed him to mine anywhere in Bombana. However, some people still tried to mine gold on land they deemed to own, working illegally in the forest or on their own land. In 2012, the Bombana government cancelled the mining card. Under the 2009 mining law, the Bombana government issued a production licence (*Izin Usaha Produksi/IUP*) and an exploration licence (*Izin Usaha Explorasi/IUE*) to some mining companies. In the community, people mostly knew the term *IUP* rather than *IUE*, but sometimes thought they were the same. While companies with the *IUP* can only conduct production activities, some mining companies with *IUE* have progressed through to exploration activities. To navigate corresponding legal issues, all mining companies in Bombana must work with the landowner to explore for gold, and these collaborative works are called partnership systems (*Sistim mitra*) (see Pidani, 2015).

Studies About Small-scale Gold Mining to Sustain Livelihoods

Gold mining activities in Bombana can be categorised as small-scale mining, as evidence Bombana mining shares attributes with other small-scale industries such as using non-mechanised techniques (for instance, *dompeng* or sluice box) and individual or group work. Hentschel, Hruschka, and Priester (2003, p. 5) note that small-scale mining is distinguished by ‘the presence of permanent, fixed installations established once the existence of an ore body is confirmed’. They also argue that small-scale mining activities are known as informal or illegal in the market sectors, and these activities are conducted by individuals, groups, families, or cooperatives with no or minimal mechanisation (Hentschel, Hruschka, & Priester, 2003). In Indonesia, the gold mining sector is one of four major small-scale mining sectors (Aspinal, 2001, p. 5). Activities described by such terms as small-scale mining, artisanal mining (ASM), and artisanal gold mining (ASGM) are usually regarded as illegal according to Indonesian mining laws (Aspinal, 2001, p. 5).

To understand how Bombana people sustain their livelihoods in mining sites, I refer to anthropological studies conducted in both mining and non-mining communities. Drawing upon Robinson’s (1986) work, I investigated Bombana small-scale mining issues, particularly miners’ strategies to maintain their livelihoods, changes in social life, political economy,

gender issues, community development, and changing class structure. Robinson (1986) is a pioneer of anthropological studies into issues of political economy and mining developments in Indonesia. She examined the advent of a foreign-owned nickel mining company and its impact on approximately 1000 indigenous Soroakan people's livelihoods (Robinson, 1986). She illustrated how the capitalist mode of production influenced changes in all terms of production and also in culture and ideology (Robinson, 1986, pp. 111-133). I adopt her analytical approach in investigating the changes in social life—particularly cultural practices associated with marriage and family relations, along with women's positions and roles in society (Robinson, 1986, pp. 215-238). Cultural notions are important and relevant to how individuals secure livelihoods. As McWilliam (2011, p. 61) notes, East Timor rural populations rely on blessings and providence from a spiritual and moral authority—that influences their natural environment to sustain their livelihood. Furthermore, Purwanto (2018, p. 141) notes that understanding livelihoods is not only a matter of economic activity but also involves political issues and community history.

People use a range of strategies to maintain livelihoods, that suit their circumstances. In sub-Saharan Africa, miners engaged in both smallholder farming and small-scale mining, and these dual strategies helped them to survive (Hilson, 2011). Bryceson and Jønsson (2010) found the same pattern for miners in Tanzania rural East Africa. Erb (2016) notes that manganese mining provides alternate livelihoods for survival in poor farming communities in West Nusa Tenggara, Indonesia.

At Bombana mining sites, farmers became miners to sustain their livelihoods (Zulkarnain, 2010). Bombana miners have *sistim mitra* (*mitra* system) as a strategy to navigate ambiguities in mining laws to participate in various mining activities to sustain their livelihoods (Pidani, 2015). However, there is a factor called *rezeki*—a notion adopted from Islamic values—that underlies their motivation to mine gold and to sustain their livelihoods (Zulkarnain, 2010). Bombana miners encounter considerable risks along their journey to maintain their livelihood, and they take these risks in pursuit of what they perceive to be *rezeki* as the local term of people's mining motivation. In this thesis I further investigate the various risks (that most people call *bala*) taken to sustain their livelihood in the small-scale gold mining community in Bombana.

Risks of Mining on People and the Environment

Numerous studies have exposed the negative environmental and health impacts of mercury resulting from both small-scale and large-scale mining activities across the Indonesian archipelago.

I have noted in the first page of this thesis, that the local media (*Kendari Pos* and *Kendari Express*) and some researchers (Zulkarnain, 2010; Pudjiastuti, 2010 cited in Zulkarnain, 2010, p.11; Trisnawaty, Emiyarti and Afu, 2013) have emphasised the risks associated with Bombana mining including environmental deterioration and mercury contamination. Castilhos et al. (2006) conducted studies in Galangan, Central Kalimantan and Talaawan, North Sulawesi and highlighted the excessive amounts of mercury found in fish in local waterways. In addition, Bose-O'Reilly et al. (2010) report on mercury contamination and mercury toxicity-related diseases in an environmental and health evaluation completed in the same region, Galangan, of Central Kalimantan and in Tatelu, Northern Sulawesi.

My study emphasises children's participation and the potential risks of mining for them in Bombana small-scale gold mining. A study conducted by the International Labour Organisation/ILO of Jakarta (2004) found that children working in mining areas engaged in the same types of jobs as adults. For children who independently work, the time they spend mining ranged from one to six hours per day. Those who worked for a unit or miner group, worked from eight to eleven hours per week. The International Labour Organisation (2004) study emphasised that the biggest risk of mining for children is tunnel collapse, which results in the deaths of children. Another risk is drowning when they dive for gold in the river. They also identified issues in the education sector relating to children involved in mining: the low number of educators in mining communities; low teacher attendance; inability to finance education among families; and lack of motivation to improve children's education. In addition, the impacts of chemicals such as mercury have become serious issues for children and the general population who live around Kelian mining sites.

I used comparative studies conducted in overseas settings to interrogate the child labour and youth labour in small-scale mining and its impacts on their health. Hilson (2008) argues that children's involvement in mining is a worldwide problem, and his own research focuses on child labour across small-scale mining communities in sub-Saharan Africa. The problems he found result from the complexity of cultural issues, household-level poverty, and rural livelihood diversification (Hilson, 2012, p. 1663). To understand the driving motivations for children engaged in mining, Hilson (2010) conducted research at mining sites in Ghana and

concluded that the main reason for children to mine was to follow their families because of poverty and family hardship. These activities resulted in many problems for children, particularly lack of education. The implications of children engaging in mining are not entirely negative, given the fact children work to help their families and earn money for their education (Maconachie & Hilson, 2016). However, it has been found that children's involvement in mining negatively impacts their health, safety, and morals (Jennings, 1999). Besides the immediate impacts on their physical health from chemicals exposures to dangerous machinery—their participation in mining also puts stress on their bodies which can cause subsequent illness and disease (O'Donnell, Rosati & Doorslaer, 2005; O'Donnell, Doorslaer & Rosati, 2011). Poor conditions endured during child labour carry negative consequences in their adulthood (Rosati & Straub, 2006).

Studies of Risks and Risk Perceptions

Smith, Ali, Bofinger and Collins (2016) suggest that researchers who study problems related to health and safety in small-scale mining sectors should adopt a comprehensive and regional approach using both qualitative and quantitative methods. Given the evidence offered by laboratory measurements of mercury effects on the environment and humans, the explanations of the health risks are mostly determined by the views of the health professionals or researchers within the realm of statistical probability (Boholm, 2003, p. 161); consequently, there is a lack of explanation from cultural and social perspectives of the health risks that arise. Anthropology provides us with the understanding that the perception of risk is a social process, and that it is culturally constructed (Douglas & Wildavsky, 1982; Boholm, 1996).

My analysis of risk will look at gold miners' perceptions in the Bombana mining community and investigate local strategies to ameliorate those risks. Several cultural risk theorists (Douglas & Wildavski, 1982; Wildavsky & Dake, 1990; Dake, 1991, 1992; Boholm, 1998, 2003, 2008; Boholm and Corvellec, 2011) have guided my inquiry to understanding risk perception and risk amelioration strategies among gold miners. Definitions and perceptions of risk are highly influenced by culture. Dake (1992, p. 21) noted that cultural systems of belief among individuals influence how they interpret risks. Boholm (2003, p. 159) argues that culture is a 'black box' of risks that can define how people perceive and determine risks. Gifford (1986, p. 214) suggested considering the constellation of meanings of risk when communicating the language of risks for medical and lay contexts.

To establish my basic understanding of the perceptions of health risks within the Bombana community, I refer to the definitions of health, social determinants of health, and health risks provided by the World Health Organisation (WHO). According to WHO, 1978 (p. 1): ‘Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. In this thesis, I not only focus on human diseases and disabilities resulting from mining activities but investigate a broad set of social and behavioural factors that influence health risks.

Table 1.1 Social Determinants of Health (SDH)

- Genetic and environment conditions - Availability of health services - Financial - Economic - Political - Cultural factors

Table 1.1 Source: World Health Organisation, 2011

The Commission on Social Determinants of Health (CSDH) of the World Health Organisation (2011, p. 1) refers to Social Determinants of Health (SDH) as the conditions in which people are born, grow up, live, work, and age; and these conditions influence a person’s opportunity to be healthy, ‘his/her risk of illness’, and life expectancy, and these intertwined factors affect public health status at both the individual and community level. Specifically, WHO (2002, p. 9) defines risk to people's health as something that carries ‘a probability of an adverse result, or a factor that raises this probability. Health risks include communicable or non-communicable diseases, injury, and the chain of causes for health risks extends from socioeconomic factors through to environmental and community conditions to individual behaviours.’ (WHO, 2002, p. 13).

To further assist my understanding of risk perception in the community, I consider factors related to individual social characteristics, such as age, maturity, and sexual identity. Boholm (2003, p. 495) argues that individuals’ social characteristics can shape their perception of factors that relate to and impact their roles in the community. In my study, I asked questions: How do individuals in Bombana perceive the risks of mining, and how do these perceptions differ across categories such as sex (men and women) and age (children and adults)?

Social factors also influence an individual's perception of risks. Douglas and Wildavsky (1982, p. 14) claim that the perception of risks is socially constructed. Social factors—including political issues and the political sphere as part of the culture—influence individuals' risk perceptions (Douglas & Wildavsky, 1992). Religion is a socio-cultural system (Geertz, 1960; 1966). Religious values embodied in Bombana people influence their perceptions of risks and particularly in mining risks. Most Bombana people are Muslim, and I will discuss how the morality of *rezeki* is basic to the Islamic belief system (see chapter two).

Soemarwoto (2004) studied local terminologies of risks in small-scale mining in Indonesia. She investigated the traditional cosmology of a small-scale gold mining community in Pongkor West Java, focussing on the issues of changing perceptions of nature among the upland Kasepuhan people (Soemarwoto, 2004). Soemarwoto and Ellen (2010) outline the traditional cosmologies of the Kahayan people regarding physical accidents and mercury in Pongkor gold mining. My thesis differentiates by specifically examining the impacts of gold mining on children and women along with traditional miners, as well as society more broadly. Unlike her study, which focuses on old areas of gold mining that have been established for decades since colonial times, my study is focused solely on mining the newest gold deposit found in 2008.

In addition to studying perceptions of risks in gold mining, I also investigate the meaning of money exchanged and the moral issues surrounding these transactions. In some cultures, money resulting from mining activities is associated with dangerous goods. Parry and Bloch (1989) argue that cultural meanings and morality always attach to money transactions. Maurer (2006) investigated the anthropology of money and argued that money generates radical revolutions through its social role and meaning. Werthman (2003) writes that in Burkina Faso money resulting from gold mining is termed 'bitter money', which suggests that money from gold mining will negatively impact people's lives. For people in a Madagascan sapphire-mining area, money from mining is recognised as 'hot money' (Walsh, 2003, p. 290). Znoj (1998) found the same term used among the Rejang (Sumatra-Indonesia) people to describe money derived from gold mining. His research on the concept of hot money is closely related to what I explain in Chapter Two (see the notions of 'hot money' and *jinn*). However, his research and my study differ because I am looking at how the notion of risk perception is also associated with hot money. I also explain the counter mechanism for the risks of hot money, seen in the traditional indigenous rituals of the Moronene.

Michael Taussig's (1980) work explores how morality, fetishism, and cosmology guided the miners' responses towards mining as a new economic activity. Taussig (1980)

explored the capitalist developments in Colombia and Bolivia. He explained how the indigenous peasants believed in the Devil and God as ‘fertility spirits of nature’ (Taussig, 1980, p. 13), and investigated how their belief in the Devil was intertwined with their understanding of production in capitalism, including sustaining and accumulating production (pp. 13-38). Moreover, he described how the peasants’ belief in the Devil, as implemented into traditional rituals, was enforced against the logic and process of colonial economics initiated by the capitalist society (Taussig, 1980). He concluded that fetishism of evil has intruded into the conflict between the pre-capitalist (peasants) and capitalist (proletarian) societies and that this conflict has altered the lives of this indigenous Bolivian community (Taussig, 1980). He also explored how customary beliefs allow miners to interpret and understand capitalism, and the transaction of money (Taussig, 1980).

June Nash (1972; 1979) explored the construction of ideology, belief and rituals, class-consciousness, traditional culture, ethnicity, symbolism, morality, indigenous beliefs, and ritual processes among the Bolivian tin mining community. Her work has ignited questions for me to investigate in Bombana’s mining community. Nash (1979) explores how the indigenous Bolivian tin miners maintained their beliefs in *Pachamama (B)* (Mother Earth) and the transformation of the Devil, called *Tio Lucas* (*Tio* means ‘uncle’ in Bolivian). Using Marxist analysis, Nash (1972) argued that Bolivian miners have used their traditional cultural assets to understand and resist the capitalistic mining company that contributed to the political and social dynamics in a Bolivian tin mining community. The resistance resulted from the Banzer’s government repression of political opposition, predominantly by miners and peasants (Nash, 1972).

I follow the paths of scholars who have investigated social issues and politics in mining sites in Indonesia. Welker (2009, p. 148) investigated the impacts of gold mining activities on society, the environment, and the rights of indigenous people (Welker, 2009). Großmann (2018, p. 835) highlighted the importance of social media (Facebook and WhatsApp) to improve solidarity and cohesion, creating a solid community as an ‘imagined community’ in Bangka (Sumatra) mining sites.

Gender issues can be significant in examining risk perceptions in the community (Flynn, Slovic & Mertz, 1994; Finucane, Slovic, Mertz, Flynn & Satterfield, 2000). I explore women’s engagement in mining (see Chapter Five), and I consider both women and men in my analysis of gendered risk perceptions. To scaffold my understanding of gender issues in mining, I refer to theories of gender in Indonesia exemplified by the work of Robinson (1986; 1991; 1998; 2004; 2006; 2007; 2008; 2014) and Robinson and Bessell (2002). To understand gender

issues in mining, I refer to some studies by Robinson (1986, 2008), Lahiri-Dutt and Robinson (2008); Grosmann, Padmanabhan and von Braun (2017); and Großmann and Gullo (2022). Although most of their studies emphasised gender in industrial mining, my study of gendered risk perceptions in small-scale mining benefits from those theories.

I also refer to some studies of gender in small-scale mining overseas to understand gendered risk perception in Bombana. Yokofleva (2007) utilises a gender mainstreaming approach to study people's perspectives on female participation in artisanal and small-scale mining in Ghana, arguing that there is a need to promote viable employment that benefits women living in rural areas. Werthmann (2009) investigated female perspectives on gold mining in Burkina Faso, concluding that these informal activities fascinate girls and women because of easy incomes that allow them to enhance their lifestyle and freedom. However, Moretti (2006) found that gender factors in Kaindi PNG society became obstacles for women participating in gold mining. Hinton, Veiga and Beinhoff (2003) outline the allure of gold mining that does not benefit women in some areas of the world, arguing that gender role strategies will empower women in mining sites. They also argue for a gender-sensitive approach, empowering women to take roles in reducing mercury risk in society through communication and mitigation strategies (Hinton, Veiga & Veiga, 2003).

My Research Setting: Rau-rau Village in Bombana, City of Gold

The journey to my research setting, Rau-rau village in the Bombana district of gold, started in August 2014. It took me approximately two and a half hours to travel from Kendari to Bombana, passing through South Konawe (*Konawe Selatan/Konsel*) district. When I arrived at the border between Bombana and Konsel, a tall brick gate greeted me with the notice '*Selamat Datang di Taman Nasional Rawa Aopa*' (Welcome to Rawa Aopa National Park). I noticed the Australian Aid logo placed on both the gate and the nearby monument. While resting at the local food stall, I heard from an officer of the National Park that the Australian government had built a good road through the National Park to Bombana city because the gold was found in that area. After another 30 minutes of driving, I arrived at the government-sponsored migration called *transmigration*¹ settlement area (*Satuan Pemukiman/SP2*) where

¹ According to *The Bahasa Indonesia dictionary*, Transmigration is a term for displacement of people from one densely populated area (island) to another sparsely populated area (island) (Sugono et al., 2008)

paddy fields spread like green carpets on both sides of the road for ten kilometres. Then after 20 minutes, I arrived at Lameroro village of the Talabente sub-district, where my family and I settled during my research period (from July 2014 to July 2015 and continuing from December 2015 to January 2016). From this place, it took approximately 20 minutes to reach Rau-rau village by car during my research visits.

I decided to live at a distance from the mining sites of Rau-rau village for health and security reasons. I was concerned that living close to the mining areas marked exposure to the negative health impacts of mining—for instance, exposure to mercury and I was concerned for affecting my family, particularly the children. The presence of mercury in the Tahi Ite River, Rau-rau village was clearly explained by Trisnawaty, Emiyarti and Afu (2013).

Administratively, Rau-rau village is part of Rarowatu sub-district and Bombana district. Bombana district lays on the southwestern side of Southeast Sulawesi. In 2003, the district sought administrative separation (*dimekarkan*) from Buton district, which was endorsed according to the *Law of Indonesian Republic No. 29*. Bombana district was earlier called the Rumbia district (Limba et al., 2014)

Table 1.2. Demographic Data of Rau-rau Village in 2014

Inhabitants		Sex ratio is 109.21	Density is 52.07
Male (M)	Female (F)	(This means: there were 109 males for every 100 females)	(This means: there were 52 people in every km ²)
1,043	955		
Total: 1998			

Source: Reproduced from The Bombana Bureau Statistics (*Badan Pusat Statistik/BPS Bombana*), 2014

Demographically, there were more males than females living in Rau-rau village (Badan Pusat Statistik/BPS Bombana, 2014) (see the table below). According to Rais, Pak Desa (the head of Rau-rau village), most residents are indigenous Moronenes and Muslims. There were also small numbers of Buginese, Javanese, Munanese, Butonese and Tolakinese people, and some migrants and non-Muslims regarded as local people of Rau-rau (*orang lokal Rau-rau*). Pak Desa added that many Buginese people live in the mining settlements and are not categorised as locals (*orang lokal*) of Rau-rau (see chapter two regarding local and migrant identities). In this thesis, I will use the term ‘residents’ to refer to both local and migrant people

in Rau-rau mining sites. Most residents indicated their main occupation as farmers, and some indicated themselves to the miners. In fact, most farmers alternated their occupation as a farmer with secondary mining jobs.

Rau-rau has an area of 38.37 km², divided into three hamlets (*dusun*) Sawey, Lampeantani, and Tahi Ite. Rau-rau shares the border with North Poleang sub-district in the west, Pangkuri village in the east, Southeast Poleang district in the south, and North Rarowatu district in the north (BPS Bombana, 2014). From Talabente village—where I lived—in the Rumbia sub-district, I had to pass through five villages to reach Rau-rau village. As we entered Rau-rau village, there was a small area of rice paddy fields (*sawah*) on the right-hand side behind local houses. On the left-hand side, cashew trees lined the road.

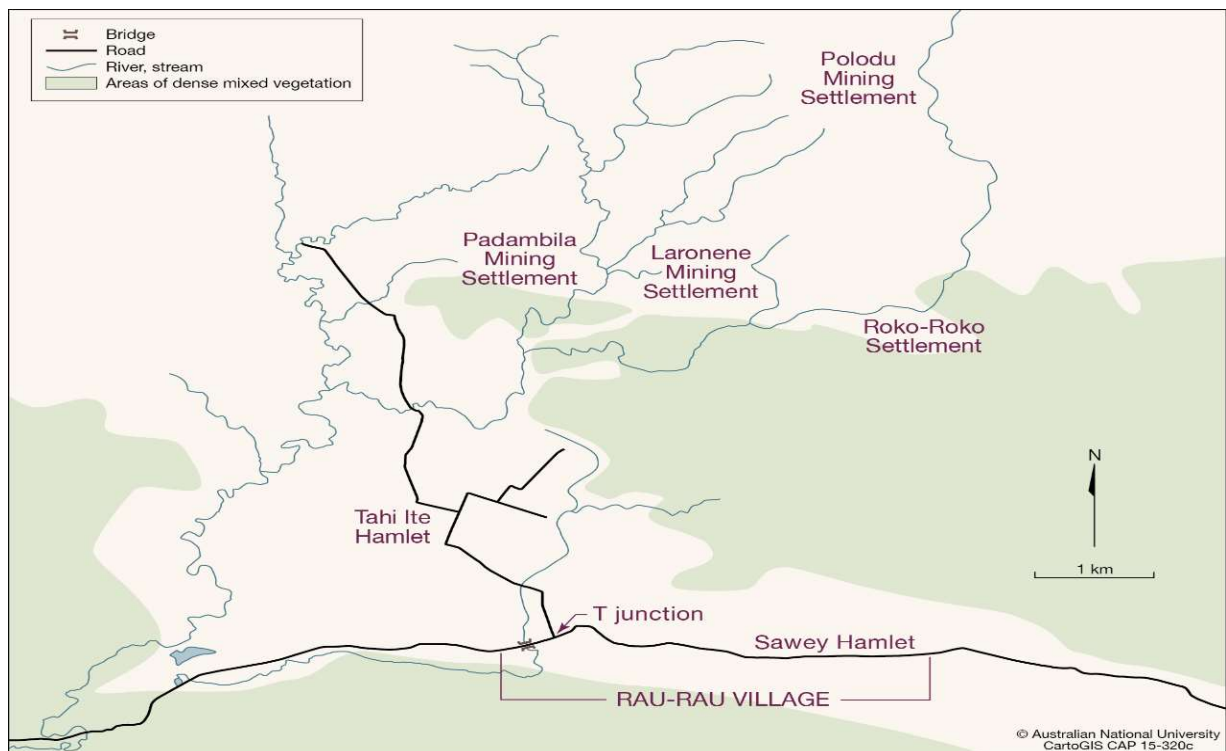


Figure 1.3. Map of Hamlets and Mining Settlements in Rau-rau village
CartoGIS, College of Asia and the Pacific, Australian National University, 2014

Tahi Ite hamlet covers all the mining settlements with locations in barren areas up on the hills, including Padambila, Laronene, Polodu, and Roko-roko. Using a motorbike, it took me approximately 15 minutes to reach Tahi Ite hamlet, 30 minutes to reach Padambila settlement, 60 minutes for Laronene settlement, and 1.5 hours to reach Roko-roko and Polodu settlements.

Medical Anthropology and Cultural Epidemiology

My investigation of Bombana mining (the motivation to mine, mining practices, risk perceptions and amelioration of risks) combines medical anthropology and epidemiology, an approach termed as ‘cultural epidemiology’ (Trostle, & Sommerfeld, 1996; DiGiacomo, 1999; Weiss, 2001; Broom, Banwell, & Gardner, 2013). Cultural epidemiology also means ‘culture impacting on health’ (Broom, Banwell, & Gardner, 2013, p. 21). Inhorn (1995, p.285) emphasized there is considerable divergence between anthropology and epidemiology relating ‘to their topics of the inquiry, epistemological assumptions, methods of data collection and notions of risk’. But while medical anthropology and cultural epidemiology have obvious epistemological differences, they share commonalities (Baer, 1997, p. 1565). For example, both epidemiology and anthropology use the emic framework for cultural studies of health risks (Weiss, 2001, p. 5). Those approaches are natural allies of bioscience to help understand the concept of health risks in society (DiGiacomo, 1999, p. 436). These two disciplines focus on health risk-related behaviour (Janes, Stall, & Gifford, 1986, p. 3). As a scholar who began as an epidemiologist, and subsequently became a medical anthropologist, combining medical anthropology and cultural epidemiology was the obvious choice for my research into Bombana mining.

Godoy (1985, p. 210) as well as Ballard and Banks (2003, p. 306) have suggested anthropological studies of mining can become important to understand human issues in mining fields. My anthropological study will examine issues regarding Bombana people’s motivations to engage in mining, various mining practices, perceptions of health risks, and risk amelioration strategies. As an anthropologist, I examine Bombana mining activities as perceived by the local people or ‘from the native's point of view’ (Geertz, 1974, p. 29).

Research Participants and Data Collection

My approach to data collection began with building trust among individuals in Rau-rau village, by contacting community leaders such as the head of the village (*Kepala desa/Kades*) and health professionals such as village midwives (*bidan desa*) and village nurses (*perawat desa*). I conducted individual interviews with people who I thought could give me information and insights into the health impacts of Bombana’s mining activities.

To approach those government officers, I showed them the research permit from the provincial government, to establish good rapport when requesting written information and data. I interviewed key government officers and health professionals whose duties were related to my topic according to the table below:

Table 1.3 Various government agencies/departments according to their responsibilities:

Departments	Responsibility related mining activities
The Bombana District Environmental Health Agency (<i>Badan Lingkungan Hidup Daerah/BLHD</i>)	To maintain information, plan, implement and evaluate activities about environment impact assessment (<i>Analisis mengenai dampak lingkungan/Amdal</i>), water quality, and monitoring mining company activities.
The Bombana Health District (<i>Dinas Kesehatan/Dinkes Bombana</i>)	To maintain information, plan, implement, evaluate and monitoring public health related issues in mining sites.
The Community Health Centre (<i>Pusat Kesehatan Masyarakat/Puskesmas</i>)	To give health interventions including neonatal care, environmental health, health promotion, communicable and non-communicable diseases, prenatal care and emergency care.
The Bombana District Local Planning Agency (<i>Badan Perencanaan Daerah/Bappeda Bombana</i>)	To plan and budget any activities related to allocating mining concession areas, to maintain communications with the district parliament members, the <i>Bupati</i> (head of district), stakeholders and communities on issues relating to maintaining safe mining activities for the community.
The Bombana District Mining and Energy District Officer (<i>Dinas Pertambangan dan Energy Daerah Bombana</i>)	To plan, implement, evaluate and monitoring the mining activities. To promote safe mining activities in the community.

Source: Fitrilailah Mokui' thesis proposal, 2013

Most of the information I obtained through informal individual interviews, I also conducted planned focus group discussions as well as spontaneous group discussions. I conducted a survey for around 200 participants. By combining their various methods of gathering information in the field, I collected comprehensive data for my analysis.

I conducted continuous and frequent participant observations at the Rau-rau Integrated Health Post (*Puskesmas Pembantu/Pustu*) on the 15th of every month from September 2014 to June 2015 the day was termed *Pos Pelayanan Terpadu/Posyandu* (Integrated health post) day. This was a regular occurrence on a date agreed by the *Puskesmas* officers, village midwives, *Pustu* Cadres and the community members, to implement the *Pustu* services such as health

checks for mothers, babies and children). I accompanied *Pustu* cadres and the village midwives in carrying out baby weighing, infant checking, and tending to pregnant women.

After the *Posyandu* time, I was able to discuss issues with the *Puskesmas* officers in the *Taubonto Puskesmas*. They implemented activities such as environmental health initiatives, health promotion, and infectious illness surveillance or wanting to know more about their knowledge and understanding of the health impacts of mining activities. I maintained close relationships with these *Puskesmas* officers by joining their occasional gatherings (*acara makan-makan*) in the village nurse's official residence.

I conducted observations in mining settlements. However, I needed to consider the weather when planning my visits to remote mining sites. The road was very dusty during the dry season, and it took me one hour to reach the location in a four-wheel-drive vehicle. I also was reluctant to visit there during the rainy season because the road was very slippery and there was a danger of driving off the road over the cliffs. Therefore, during the wet/rainy season, my observations mostly took place in the Padambila mining settlement, which is part of Rau-rau village and which I could reach easily by motorcycle.

As part of administrative procedures to protect my security, the head of Rau-rau Village, Rais, who was famously called Pak Desa, suggested me to maintain contact with the army and police officers in the village. I had a contact with Saleh, a district army personnel (*Angkatan Bersenjata Republik Indonesia/ABRI*) in the village called *Babinsa (Bintara Pembina Bangsa)*. He was a military officer assigned to look after the community in Rau-rau village, fostering and guiding them regarding security, carrying out social activities as a result of natural disasters and events, etc. (Wahyudin, 2013). I also was in contact with a police officer, Dedi who was assigned as The Head of the Centre for Public Order and Safety Development (*The Balai Bina Keamanan dan Ketertiban Masyarakat/Babinkamtibmas*) of the Bombana Police office. To maintain my security, I always consulted with Saleh and Dedi prior to my visits to the mining settlements. Sometimes one or both of the officers accompanied me on their visits. Pak Desa/Rais, his wife and children also once took me for a recreational visit to the mining fields and they introduced me to people in the mining sites.

In Rau-rau mining sites, some mining companies had mining concessions including PT. SAM, PT. Tiran, and PT. Lamoran. Prior to my visit to their concession sites, I always obtained permission from the mining officer recognised as the owner or responsible person of the mining settlement. I observed miners as they engaged directly in mining activities such as digging shafts, moving materials, panning and using trammel drums for amalgamating mercury with gold ore, burning amalgam, managing tailings, and selling gold. I spent time with people who

were indirectly involved in mining activities, such as food vendors and parents looking after their children.

Some people voluntarily gave me their time as unofficial research assistants. They were happy to help me because they wanted to get a connection with a lecturer from Haluoleo University that can help their children to go to university in the future. They were also happy to have relations with people who come from overseas, whom they regarded as respected people. I hired two research assistants, Dani and Hendra who graduated from The Public Health Department-Haluoleo University. They accompanied me to carry out interviews, observational visits, and assisted with photography, filming and transcribing the recorded interviews. They helped me to collect epidemiological information (information about frequency, distribution, and determinants of health problems) as well as information from the mass media. At the end of my study, I conducted a survey with a semi-structured questionnaire among miners and the community, to obtain a more comprehensive understanding of community perceptions of the health impacts and risks of mining. I kept a diary and recorded all the data I had gathered in the field, and I analysed this data using thematic analysis and visual interpretation methods.

I used a method of purposive criteria when choosing miners to interview. These criteria are listed and used in analysis included in the table below:

Table 1.4 The list of criteria for selecting miners for interview and analysis

Criteria	Variables
Gender	Women and men
Mining activities	Miners and non-miners
Age	Children, young adults, adults, and older people
Migration	Locals/Rau-rau people and non-locals/migrants
Ethnicity	Moronene, Muna, Buton, Bugis, Tolaki and Java.
Mobility	People who are living in the village and living in the camp or outside Rau-rau
Religions/beliefs	Islam, Christian, Buddhist, Hindu, and traditional beliefs (including <i>Kepercayaan Kepada Tuhan Yang Maha Esa</i> / those who believe in God but are not engaged with a formal religious group)
Employment	Employed in a private company, public servant, unemployed, self-employed (e.g. farmers, builders, carpenters)
Exposure to technology	Internet browsing, reading newspapers regularly, possessing a mobile phone, watching TV, and listening to radio

Source: Fitrilailah Mokui' thesis proposal, 2013

In selecting interviewees, I used a snowball technique. The method started with a preliminary interview with anyone in the village and gathering information regarding those criteria. When I thought I needed criteria, then I probed the information to anyone. I continued to choose some participants that match my criteria in the table.

I also interviewed officials from relevant government agencies at district and provincial levels and also community leaders, representatives of NGOs and religious leaders. I compared and contrasted the information from these interviews with my field observations and the data surveys.

My research was loosely connected with a research project entitled Artisanal Mining for Development in Eastern Indonesia: Risk Assessment and Response.² I attended several training courses during my studies, such as one on research methodology to investigate the social impacts of mining activities. I facilitated the implementation of training for health providers to detect mercury toxicity in collaboration between the ASM and the Bombana Health District (*Dinas Kesehatan/Dinkes Bombana*). I also engaged in several activities for this mining project such as collecting water samples and sediments to investigate mercury contamination of those materials.

Communicating the *Bala* (risks) and *Rezeki* in the Field

To communicate the terminology of ‘risks’ and ‘health risks’ to the Bombana people, I used terms in the local languages that can be glossed as ‘unwanted or negative events’ (Douglas, 1992; Douglas & Wildavsky, 1992).

To understand how individuals understand and define the health risks of mining, I framed questions—mainly open-ended—that would elicit more than a ‘yes/no’ answer, such as:

1. What are the advantages of mining activities in this area? And what are the disadvantages in this area?
2. Do ‘you’ or ‘people’ see/heard or have you of any health problems due have health problems due to mining activities?
3. Do you recognise any health risks from mining?

² This project was funded by Australian Government through its Australian Development Program and implemented by collaborations between Charles Darwin University, the Australian National University, the Regional Environment Body of Nusa Tenggara Timur Province (BLHD of NTT Province), and Haluoleo University in Southeast Sulawesi. <https://asm4d.wordpress.com/>

4. Are the health risk of small-scale mining: hidden risks (we are unlikely to encounter them)? involuntary risks (we would not willingly accept them)? or irreversible risks (there is no turning back)?

5. Are there different ways individuals from diverse backgrounds perceive the health risks of mining: as a disaster/danger or a neutral event?

6. Are risks of mining activities discussed and debated, and do they lead to disagreement among individuals?

7. What strategies are implemented to reduce levels of risk?

Throughout the study, I spoke with my respondents in Indonesian, using Indonesian terminology for risks, to name a few: disadvantages (*kerugian*), consequences (*akibat*), threat (*ancaman*), danger (*bahaya*), tunnel collapse (*tanah runtuh*), bad luck (*sial*), diseases (*penyakit*), and unpleasant consequences of mining activities (*akibat yang kurang menyenangkan dari kegiatan penambangan*). I found out that the people mostly used the terminology of *bala* referencing traditional concepts in local languages—such as Moronene and Bugis—in referring to health risks arising from small-scale gold mining (see chapter 2).

When I interviewed government officers, they mostly used the phrase ‘health risks’ (*resiko kesehatan*). Those people linked the health risks with *resiko penyakit* (disease risks) and *penyakit* (illness or disease). I interviewed Pak Tarzan, a Public Health Officer from the Bombana Health District (*Dinas Kesehatan/Dinkes*) Bombana, about the risks of mining. His job description required him to maintain records of the workplace health and safety issues in Bombana mining sites. He also talked about mining risks. From his perspective as a health officer, health risk (*resiko kesehatan*) implies the probability that someone will get sick or encounter a hazard. From his epidemiological background, he defined health risks as the chance to be exposed to diseases and used epidemiological risk theories and formulas to measure the probability of risks. He used quantitative data to record the health risks of mining, for example, injury numbers, malaria prevalence, and diarrhoea prevalence. Overall, he interpreted the word ‘health risk’ as the possibility of someone being injured, falling, or experiencing worse situations or conditions.

However, although negative consequences of gold mining—particularly the health risks or *bala*—frequently emerged in my conversations with people, they also viewed the journey of looking for gold positively, particularly seeking one’s fortune (*mencari rejeki*).

People acknowledged that their main motivation to mine was to find gold, looking for *rezeki*. During my conversations with people, they mostly did not directly mention the word of ‘gold’ but replaced it with the word of ‘*rezeki*’. There were many expressions linking the word

rezeki to gold and gold mining: for instance, *rezeki tambang* (mining *rezeki*, meaning gold), increasing in prosperity (*semakin makmur*). Indeed, the concept of risks (*bala*) and *rezeki* are very connected to one another and I will explore more about those concepts in chapter two.

Chapter Outline

This introduction has scoped out why I chose to study mining practices, interpreting the local concept of motivations to engage in mining, and capturing local concepts of the health risks of mining and local strategies for ameliorating these risks. I outlined the setting of the research, the demographic and characteristics, the landscape and geography, and explained my methodology when drawing from medical anthropology and cultural epidemiology. I explained the theoretical bases for studying health risks and referenced previous anthropological research on mining that introduces the issues involved in small-scale gold mining in Indonesia. I explained the methods employed in gathering data, including challenges I encountered during my field study and my technique for asking questions concerning respondents' motivations and risks to engage in mining.

In Chapter two, I analyse how local Bombana people perceive *rezeki* as the foremost motivation to mine and explain the concept of *bala* can be understood as a traditional notion of risk. Their perceptions of mining risks are influenced by their religion and cultural values. People seek gold as *rezeki*, or 'God's gift', but also express how they should manage risks viewed as *bala* to maintain the *rezeki*. In addition, I investigate how the locals have implemented amelioration strategies to ease and manage the risks of mining, and even try to eliminate these risks through cultural rituals.

Chapter three examines the risks that miners encounter related to their livelihood and survival. I analyse political identities that underpin the interactions between the Bombana residents, the Moronene, and migrants at the mine site. The chapter looks closely at how they construct identities through interactions in the village and at the mining sites. In addition, I explain mining methods and the division of labour that occurs in several types of mining. This chapter also explores life in 'blue tent' (*tenda biru*) campsites, where the migrants reside and which are common features at the mining sites, and analyses the concomitant social problems.

Chapter four describes the silent risk of mercury and how people construct this phenomenon. I explicate factors that contribute to the ignorance on this subject, including local terminologies, belief in the benefits of mercury, the equivocal perceptions of mercury's illegal

status (including the political implementation of mercury laws), Islamic morality of mercury's status, and the mercury black market supply chains. Those factors play important roles in how people perceive mercury risks or lack of risk in Bombana society.

Chapter five investigates the connection between gender relations and risks that I termed as gendered risk perceptions in Bombana mining. I investigate women's participation in mining activities and how women construct their identities in mining sites. In addition, I explain the division of labour and economic organisation. I also examine issues related to conjugal relations and households such as adult cathexis including marriage, infidelity, and divorce. I explore masculinity and femininity in body image, taboos, and smoking behaviours among men and women.

Chapter six examines the risky involvement of children in mining. I explore how Bombana society interprets risk for children and for childhood, and socio-cultural issues, particularly morality related to children living and working at Bombana mining sites. I examine issues related to children's education, evaluating the term 'child labour' and the associated issues in Bombana mining society.

Chapter seven examines government efforts from the central, provincial, and district levels to manage the effects and risks of gold mining in the Bombana area. I focus on health governance in managing health risks. Some responsible agencies in Bombana—including the Bombana Environmental Health Agency (*Badan Lingkungan Hidup/BLH*), the Bombana Local Health Agency (*Dinas Kesehatan/Dinkes*), local police and mass media, and NGOs—have taken on roles in maintaining health governance, risk management and risk communication to manage the health risks resulting from mining.

Chapter eight summarises the views of people: What are their perceptions of the effects of Bombana gold mining on their environment, health status, children's and women's health, and wellbeing. The perceptions of the Bombana gold mining risks reflect traditional values including those of Moronene, Buginese, Javanese, Tolakinese, Butonese and Munanese. Bombana people used the term *bala* to describe risks. But against the risks of mining, people constructed the concept of gold mining as *rezeki* (a term that combines economic and Islamic religious concepts). Some non-government organisation officers and government officers perceive the health risks in Bombana mining as events of slow violence that have negatively impacted the community. However, most Bombana people have their own perceptions, and traditional strategies to ameliorate risks. In response to the risks of gold mining, either they appear ignorant of the risks or blame themselves and others for the risks: for example, they

blame the mining companies or the government's lack of funding. Or they submit to God or their ancestors.



Figure 1.4 A miner carrying frying pans, a gas bottle and digging equipment to mine gold in Wumbubangka Village



Figure1.5 A villager looking at the paddy fields near the mining sites with large excavated holes



Figure 1.6 Landscape of gold mining under PT.SUN concession before backfilling



Figure 1.7 Landscape of gold mining under PT.SUN concession after backfilling



Figure 1.8 People mined and dug holes behind the houses and the primary school near the children's playground



Figure 1.9 The border between Bombana District and South Konawe District where the National Park Rawa Aopa Watumohai located. This road was built with funding from AusAid- the Australian government



Figures1.10 Aswan family took photos with my family, Andrew and Sara Beavis during research trip to take mercury sample from Tahi Ite River for testing





Figure 1.11 Aswan's house backyard with pond and paddy field in Kasipute where my family live during the field research

Chapter Two

The *Rezeki* from God, the *Bala* and Hot Money: Perceptions of Gold, Morality, and Risk

On 29th May 2015, I met Nardi, a migrant miner, at the Onggomate mining site. Nardi worked a 50-metre shaft locally called a 'rat hole' (*lubang tikus*³). He was known as a gold rat hole digger (*penggali lubang tikus*). I questioned Nardi regarding ideas of risk, such as 'Do you think your job is dangerous or not?' and 'Do you think digging a rat hole is a difficult job?'

I asked him how he reflects on the risks of his job as a mine shaft digger, to which he replied: 'I do not think about mining *resiko* (risks), such as a tunnel collapse, because I believe God knows that I am looking for *rezeki* to feed my family at home. He believes that his partner/spouse (*jodoh*), existence (*hidup*), and death (*mati*) are all in God's hands. He was very confident that the tunnels/shafts (*lubang tikus*) would not collapse, because he and his friends employed traditional strategies to reduce these risks; most importantly conducting a blessing ritual called *syukuran* (celebration) before he dug the shafts (see the next section). Also, his family prayed to God to bless their efforts to get more *rezeki* and prevent *bala* (dangers/risks).

Bala is a local concept that means all negative consequences derived from any activities (documented below). His perception of *mecari rezeki* (looking for *rezeki*) is always linked to the concept of sidestepping *bala* (*menghindari bala*).

Like all Bombana residents, Nardi has traditional beliefs about gold as a natural resource that has agency (Mokui, 2015; Pelluso, 2018). They perceive gold as *rezeki* from God, and they also believed that gold is guarded by spirits (*jinn*) who can promote hot money and manage the risks (*bala*). In this chapter I explain traditional cosmological perceptions around gold (Soemarwoto & Ellen, 2010, p.233) in Bombana mining sites.

In this chapter, I employ the anthropological approach of participant observations collecting statement from respondents about ideas of morality and also observing how they drew on these concepts in daily encounters. Anthropologists approach the concept of morality as heavily defined by a particular culture, and their socially approved habits; and can be categorized as normal or abnormal (Benedict, 1934 p.1). Durkheim (1953) argued that the

³ Miners informed me that they dug a rat hole (*lubang tikus*) as vertical or horizontal shafts varying from approximately 5 meters to 50 meters long or deep.

science of morality is never about what is right but is about the reasons individuals have faith that something is right or wrong in a particular society (cited in Bellah, 1973). Zigon (2008, p. 1) argues that morality is another term for socially approved habits and refers to 'religious practices, ritual, reciprocity, or kin relations'. Similarly, Csordas' (2013, p.536) argues that morality is a cultural system and a modality of action in every sphere of human life, including religion, ideology, law, and politics. Morality is the symbolic conflict between good and evil. Cassaniti and Hickman (2014) argue for moral diversity: moral practices and moral goods differ across cultures. Kleinman (1999, p.72) advises that we must deliberate on moral experience and personal experience to understand morality.

This chapter explains how people in Bombana perceive gold and gold mining related activities as God's gift (Gregory, 1980; Mauss, 1990), termed as *rezeki*. I present the various meanings of *rezeki*, including its meaning in Islamic morality. Gold is perceived as material guarded by *jinn* and ancestor spirits (*arwah leluhur*) and a natural resource which can promote hot money. Finally, I explore how people conduct rituals and traditional calculations to ameliorate *bala* (traditional risks) and at the same time maximize and maintain gold *rezeki*.

God's Gift of *Rezeki* and Motivation to Mine Gold

Darma, a miner of PLM *mitra* who lives in Rau-rau village told me that her neighbour, Ali, went secretly to the PLM concession areas to find *rezeki*, meaning gold, at nighttime month before. However, the police, who also works as a security guard of PLM caught him and his friends. It was unfortunate because the security officers confiscated all his *rezeki* (soils he hoped contained gold). As punishment he was stripped of his clothes and forced to clean the PLM office every day for several hours). Darma said that her neighbour was only looking for *rezeki* to support his family because they do not have paddy fields (*sawah*). She pointed to his wooden stilt house standing on the rocky hill in front of her house.

Darma emphasized that the poor Ali had only wanted to find *rezeki* to fulfill his duty. The husband just wants to find *rezeki* for his children and wife in order to survive. As the respected head of the family and as a man, he expected to provide for his household. The motivation driving Darma and other residents in Bombana to engage in illegal activities at the mining sites was to find *rezeki* to provide for their family. People can exchange gold for money and other materials for primary, secondary, and tertiary needs.

Reports in local and national newspapers have also highlighted *rezeki* as the reason why people participate in Bombana gold mining. For example, Muttaqin (2009), in the online news called My country's archipelago news network (*Jaringan Pemberitaan Nusantara Negeriku/JPNN*), published the headline 'Scrambling for digging gold *rezeki* in the Dewi Sri Land of Bombana' (*Berebut Menggali Rezeki Emas di Negeri Dewi Sri Bombana*). Another headline proclaimed 'Bombana goldfields, Between *Rezeki* and Dangers' (*Ladang Emas Bombana, Antara Rezeki dan Petaka*) (Saban, 2009).

The Bombana Government view the gold discovery as *rezeki* and *berkah* (blessings) for the community. The first former Bupati, Atikurrahman, a Bugis Muslim, announced that the discovery of gold in Bombana in his time was *rezeki* from Allah, a gift from God to the people of Bombana. The national newspaper *Kompas.com* (2008c) described a *mobeli wonua* (*M*) ritual (see the following section about ritual) held by the Southeast Sulawesi governor, Nur Alam, to officially open the community mining areas (*Wilayah Pertambangan Rakyat/WPR*) in Bombana. In that *syukuran* (celebration), the governor released seven chickens into the Tahi Ite River, Rau-rau village. These are symbolic expressions of gratitude to God who has given the *harta karun* (treasures) to the people of Southeast Sulawesi, particularly the Bombana people. One of the villagers said that the chickens are blessings from the Tahi Ite River and if the residents can look after them, they will give more and more *rezeki*. Those statements from government leaders exemplify how people around the Bombana mining area perceive gold as a gift from God.

The development of gold mining in the Bombana District was regarded as *rezeki*, as a communal fortune for all Bombana residents. However, only twenty percent of the population might mine gold there. So gold *rezeki* provides immediate material benefits to miners which accrue to the broader society.

The *rezeki* of gold increases income for the whole community as miners spend their earnings locally. But also, mining *rezeki* (*rezeki tambang*) has led to the development of infrastructure and improved transportation. The establishment of gold mining in Bombana has encouraged the central, provincial, and local governments to support some infrastructure developments in the village, such as an integrated school (*Sekolah Satu Atap/SATAP*). The head of *SATAP* Rau-rau felt that his school has received *rezeki* because enrollments have been increasing since gold mining began in the area. Most Bombana residents acknowledged that the road development through Rau-rau village supported by the Australian government is a kind of *rezeki* from God. They only had rocky, dusty and muddy roads before the gold rush

began. For the Bombana local government, the establishment of gold mining and the coming of mining investors to Bombana meant an increase in prestige and prosperity.

Some people believe that gold is a sudden gift from God and labelled it as *rezeki nomplok* (windfall *rezeki*). There are other terms associated with *rezeki* including destiny, luck, and fate. Mauss (1990, p.1) noted that free gifts require no reciprocation from the receiver. The perception of gold as a free gift conveys Adam Smith's theory of gifts from God's invisible hands, given to all residents in Bombana (Douglas, 1992, p. 162). Anything generated from gold mining is *rezeki* from God directed to a particular person and the whole Bombana community. The gold *rezeki* means that discovering gold and establishing mining activities means changing Bombana residents' lives for the better, elevating them from poverty and making Bombana more prosperous. However, other residents believe the gold is not freely given (Mauss, 1990, p.1) and that the giver (God) and the receiver (Bombana people) are engaged in a system of reciprocity.

The perception in Bombana that gold *rezeki* is God's gift (Mauss, 1990, p.5) is a social phenomenon involving morality and political and economic practice. The gift is always a reciprocated. In return, the people of Bombana, particularly miners, should maintain good morality according to ethical standards, believing that this will maintain the sustainability of gold in mining sites. Mauss (1990) recognized this as the morally sanctioned gift circle (Douglas, 1992, p. 189). This gift transaction in Bombana mining fields operates between two parties: one is real (people), and the other is imagined (God, *jinn*, and spirits). Moral sanctions attach only to the people, specifically Bombana miners. They should always maintain good morality and conduct traditional and religious rituals properly to obtain more *rezeki*.

Acculturation of the Notion of *Rezeki*

The term *rezeki* is an Indonesian word adapted from an Arabic terms in the Holy Quran (Pasmadi, 2009). According to Almaany.com (2010), the term *rezeki* is not actually used in the Quran; instead, the Indonesian word comes from the Arabic word *yarzuqu* (*A*). As written in the Quran 3rd surah, Ali Imran, ayah 37 (chapter 3, verse 37): *Innallaha yarzuqu man yasaa u bighairi hisaab* (*A*). This means: '*Sesungguhnya Allah memberi rezeki kepada siapa saja yang dikehendaki Nya dengan tidak terhitung jumlahnya*' (*I*) (Indeed, Allah provides for whom He wills without account. transl.). In addition, *yarquzu* (*A*) originally came from the Arabic word

Ar-Rizqu (A) from the root term *razaqa–yarzuqu–razq [an] wa rizq [an] (A)*. These words have been adopted into Indonesian as *rezeki*.

Table 2.1 The List of Words to Explain *Rezeki*

Bahasa Indonesia	English meaning
<i>Makanan sehari-hari</i>	Daily food
<i>Nafkah</i>	Sustenance
<i>Penghidupan</i>	Livelihood
<i>Pendapatan</i>	Revenue
<i>Uang untuk memelihara kehidupan</i>	Money to support life
<i>Keuntungan</i>	Advantage/profit
<i>Kesempatan mendapat makan</i>	Opportunity to obtain food
<i>Umur</i>	Age

Source: The *KBBI* by Sugono et al., 2008

The word *rezeki* can refer to positive benefits in all aspects of life. *Rezeki* also means that everyone can get advantages in life; for example, a peaceful soul and long life expectancy. It implies that we are constantly working to survive in our lives. The *KBBI* (Sugono et al., 2008) explains some expressions used by Indonesians when they refer to *rezeki* in Table 2.2 below:

Table 2.2 The List of Various Uses of the Word *Rezeki* in Indonesian Language (*Bahasa Indonesia*)

English	Indonesian	English meaning
Soul <i>rezeki</i>	<i>Rezeki batin</i>	Something useful for our soul, such as praying and singing.
Halal <i>rezeki</i>	<i>Rezeki halal</i>	Something we receive in a good way (<i>jalan</i> halal).
Expensive <i>rezeki</i>	<i>Rezeki mahal</i>	Hard to find necessities for living, poor returns or profit.
Eye <i>rezeki</i>	<i>Rezeki mata</i>	Something we see that is good, such as when sightseeing.
Escalated <i>rezeki</i>	<i>Rezeki meninggi</i>	Easy to receive high returns or profit.
Modest <i>rezeki</i>	<i>Rezeki merendah</i>	Everything that we do yields good returns or profit.
Easy money	<i>Rezeki murah</i>	Easy to earn a living or regular profit.
Windfall <i>rezeki</i>	<i>Rezeki nomplok</i>	Receive something real or non-real in a big amount, beyond our expectations.

Source: The *KBBI* by Sugono et al., 2008

According to Sugono et al., (2008; p.1303) in the *Kamus Besar Bahasa Indonesia (KBBI)* official Indonesian Dictionary, *rezeki* means everything that sustains life (*segala sesuatu yang dipakai untuk memelihara kehidupan*) is given by God (*yang diberikan oleh Tuhan*).

From the explanation above, we can see the idea of *rezeki* among Indonesian society, including Bombana. The wide use of *rezeki* is evidence of Islamic acculturation in the Indonesian language. Although the expression *rezeki* is adapted from the words of the Quran and Islamic teaching, most Indonesians—whether they are Muslim or non-Muslim—have adopted the word *rezeki* and embodied the spirit of *rezeki*.

On 28th February 2015, I had an informal conversation with William, a Christian Chinese miner from Central Java, at a Padambila mining site. William emphasized the word *rezeki* when he talked about his mining activities. He said: 'We come here to Padambila [gold mining site] as a family because we are all searching for *rezeki* (*mencari rezeki*)'. During my fieldwork research in other parts of Bombana, I interacted with Christian Moronene people living in Taubonto village who frequently used the word *rezeki* when speaking about mining. I also overheard the word *rezeki* repeatedly used by local migrants (*transmigran/trans*) when they told me about the mining activities around their hamlet. Transmigran/trans people are people from outside Bombana who were relocated through a national program organised by central and local government called *transmigrasi*. Transmigran people mostly were relocated from Bali to Bombana and they are primarily Balinese Hindus and Buddhists. They live in Settlement (*Satuan Pemukiman/SP*) Number Eight in Wumbubangkan village.

William believed that the terminology of looking for *rezeki* had helped create solidarity amongst the miners. When miners use the phrase '*mencari rezeki*' they are not merely communicating their intentions for economic pursuit but also highlighting their solidarity as a group of people who came with the same intention, to seek their fortune in gold mining.

Residents in Bombana who follow particular religions such as Islam, Christianity, Hinduism, and Buddhism express their spiritual identity through the expression of *rezeki* when they refer to their livelihoods. The notion of *rezeki* implies religious devotion; people tend to express this through their way of life. Religion plays a vital role in Indonesian society in shaping people's morality and values. While Indonesia is a democratic country with a majority Muslim population and has guaranteed freedom of religion to all, the Ministry of Religion (*Kementrian Agama Republik Indonesia/Kemenag RI*) only acknowledges five official religions: Islam (*Islam*), Protestantism (*Protestan*), Catholicism (*Katolik*), Hinduism (*Hindu*), Buddhism (*Budha*), Confucianism (*Konghucu*). However, it also acknowledges other belief

systems as sects if they perform belief in the one Almighty God (*Aliran Kepercayaan Kepada Tuhan Yang Maha Esa/YME*) (Putri, 2011).

The use of the phrase *mencari rezeki* (looking for *rezeki*) and interpretations of the meaning of *rezeki* is common among residents in the Bombana gold mining area. They express the notion of gold as *rezeki* for many purposes in their everyday lives. The notion of *rezeki* can be personal. People use it differently according to their purposes and orientations, the political situation, the socio-economic state, safety conditions, personal intentions, politics, morals, culture and social conditions.

Bombana residents perceive that gold represents *rezeki* and can therefore directly or indirectly benefit people economically, spiritually, and mentally. *Rezeki* can mean material substances, gold or money: yet it can also mean a non-material entity, such as a secure livelihood and living. In addition, gold *rezeki* (*rezeki emas*) implies the involvement of God when people are applying effort in the form of labour, capital or both financial and service resources in finding *rezeki*. The Bombana miners' motivation to find *rezeki* represents religious morality and values, particularly Islamic values of conducting worship (*ibadah*) and struggle for life (*jihad*).

Putting the Efforts (*Usaha*) and Supplication (*Doa*) Together: Islamic Morality of *Rezeki*

Most people I met in Bombana, particularly miners who identified themselves as Muslim, explicitly believed that gold is *rezeki*, a gift freely given by God for the people of Bombana to sustain their livelihoods. One of the religious leaders, a mosque imam, emphasized finding *rezeki* to worship (*ibadah*) Allah. Islamic teaching requires all Muslims to make an effort (*berusaha*) and make prayers of supplication (*berdoa*). People should apply effort (*berusaha*) to seize opportunities to pursue *rezeki*. Everyone cannot just wait for *rezeki* to drop in one's lap.

Bombana Muslims' belief about the effort put in to find *rezeki* as a kind of worship activity (*ibadah*) is comparable to Malaysian Muslims' belief. According to Abdullah (2013), Malaysian Muslims believe that *ibadah* is not only reflected in rituals, such as *sholat* (compulsory prayer five times a day). All activities to support life performed in accordance with Islamic values or commercial/civil activities under Islamic law (*mu'amalah*) are considered by Muslims as worship (*ibadah*) (Abdullah, 2013, p. 47). Islamic values deny the dualism between worldly and religious life (Abdullah, 2013 p. 38). For Muslims Islam is a way

of life that can bring the vertical relationship between God and humans and the horizontal relationships (between humans) into balance, in order to obtain *pahala* (rewards) in the world and the *akhirat* (the afterlife) the *syurga/jannah* (heaven) or *neraka* (hell) (Abdullah, 2013 p.47). Muslims in Bombana shared this view of Islam as *rahmatan lil aalamiin* (*rahmat bagi alam semesta*), or blessed religion. This view shapes every part of the work ethic that links personality, behaviour, and character while conducting worldly activities, such as working and studying (Rusli & Rakhmawati, 2013, p.157).

In addition, some Muslim miners considered the struggle to sustain their family as *jihad*, and indeed that all activities to support livelihood are *jihad*. The term *jihad* is not always perceived negatively—for example, to describe fighting. Instead, it has many meanings, such as working hard, making earnest efforts to achieve objectives, doing something difficult, acting against a bad situation (immoral, damaging and harmful), and maintaining one's existence (Rusli & Rakhmawati, 2013, p. 159). The terminologies of *jihad* and *rezeki* used in the context of mining expressed Islamic identity and values. Ali, a male miner, told me that he had left his family behind in South Sulawesi to conduct *jihad* (effort and struggle) for his family through mining. Although mining sites are rough and risky, Ali believed that Allah rewarded his efforts (*jihad*) to find *rezeki*. He emphasized that he always maintains his spiritual life in his working life. Islamic morality expressed in *rezeki*, *jihad*, and *ibadah* motivated him to keep his spirits up while journeying away from home (*perantauan*). These values are a positive moral force helping him maintain his spirit to work, pray and trust in Allah's plan (*tawakal*) and to exercise patience (*kesabaran*) in his life.

Bombana Muslims, like other Indonesians, frequently stated that they should look for *rezeki yang halal* (allowable *rezeki*) and avoid engaging in *rezeki yang haram* (forbidden *rezeki*). Muslims believe that the efforts looking for *rezeki yang halal* or *halal rezeki* are considered *ibadah* and *jihad*. *Halal rezeki* is an Indonesian value adapted from Islamic teaching about *halalan toyibban (A)* (*halal dan baik*), meaning what is permitted or *halal (A)* and good or *toyyiban (A)*. Quran's teachings emphasize that any food should be good food (*makanan yang baik*) and should be *halal* foods (*makanan yang halal*). *Halalan toyibban* implies a broad concept of goodness of food, including safety, quality, and cleanliness; it starts from the beginning of the food supply chain and continues to the consumer (Omar, 2011). *Halal* expresses Islamic rules according to the *Quran* and *hadiths*, meaning suitable for the soul. *Toyyiban* is based on Quran teachings and *hadiths*, one's individual cultural choices and the objective goodness of the materials/foods, meaning physically good, healthy, and beneficial for the physical body.

The term *rezeki* in business and economics is the Sharia concept, which refers to: 'value-added gains (financial, social, and the environmental), purified to become *halal*, *thoyyib* (good) and free from *riba* (interest) in every process of its attainment (Mulawarman, 2008, p. 1). In the context of *halal rezeki* (*rezeki yang halal*), people should start with good intentions to do something to obtain *halal rezeki*, and implement this in lawful, permissible ways. For example, to mine gold in mining sites, start with a good intention (*niat yang baik*)—for example, to find money to support family living expenses—and not with an evil intention (*niat yang buruk/jelek*), such as to earn money to spend on prostitution. Muslims must start with good intentions and implement these in good ways; for example, people should mine with permission from the landowner.

My research revealed that, in Bombana, Islamic morality regarding *rezeki*, *halal*, and *haram* has been extended by Muslim miners; and that these concepts are also universally applied in Bombana among most Muslim people and non-Muslims (Christians, Buddhists, Hindus).

Gold is Guarded *Jinn* and Promotes Hot Money

Most Bombana residents, Muslims and non-Muslims, have faith that gold is guarded by unseen creatures (*roh/mahluk halus*). *Mahluk halus* or *roh* refers to invisible creatures that can see humans, but humans cannot see them. These include *jinn*, possessing spirits (*roh halus*), ancestors' spirits (*roh para leluhur*) and ghosts (*hantu*). Limba et al. (2016, p.1652) noted that Bombana Moronene people believed in *nteiwonua* (*M*) (the guardian spirit of nature), and that God created all these creatures. The Moronene people believe that *nteiwonua* (*M*) and *jinn* have been participating in gold mining activities in Bombana. The common belief is that *jinn* guard all the gold in the region.

On 20th August 2014, I had a conversation with Aswan, a Moronene resident who used to engage in mining in 2008 gold rush but is no longer mining. Aswan recalled an incident in Bombana around 2009. He dug into the sand, took material from around the roots of bamboo clumps, and found a lot of gold flecks. However, his friends did not find any gold despite digging in the same sandy material. He told me: 'How come we took the same materials from the same place but the amount of gold is different? There must be *jinn* around who hide the gold'.

Aswan also remembered once when he and his friend, a boy, sat among a crowd of people squatting along the riverbed, a young female in shorts sat in front of them, showing her smooth thighs and legs (*betis dan paha mulus*). Aswan and his friend started chatting about the young woman and her 'smooth thighs' (*paha mulus*), which Aswan considered a dirty phrase. After this incident, he felt that the *jinn* who guarded the gold had heard them saying 'dirty words' and punished them by seizing the gold. Hence, they did not find any gold, whereas other people mining next to them got a lot of gold. According to Aswan, people seeking gold considered *rezeki* should not say rude words, swear, or even think about sex, which he believes is linked with a dirty mind. In addition, they should not come to mine for gold with ulterior motives, such as looking for a girlfriend or boyfriend in the mining areas. If they transgress moral values in any way, the *jinn* will punish them by hiding the gold.

Non-Muslim, William, also narrated the role of *jinn* in hiding gold. He enthusiastically showed me the mining shaft (*lubang tikus*) from which, he believed, the *jinn* had taken away gold. This incident occurred because two miners had used narcotics and illegal drugs (*Narkotika dan obat terlarang/Narkoba*) when they mined gold there. According to William, the God was angered by their behaviour, and the *jinn* hid all the gold from that particular *lubang tikus* (see Chapter Three, about social illness and drugs in mining).

According to Aswan, William, and other informants who described further their traditional belief systems, gold is perceived as a lucky material that always carries strong connections to *jinn* and ancestral spirits/animism. Along with many Indonesians, Aswan perceives gold as a 'precious noble stone (*batu mulia*)' and he believed that *jinn* guide the discovery of gold. Gold is sacred because the *jinn* guard it; they have control over it; they can control people looking for it as their *rezeki* and they can either hide or reveal it. Aswan is a Moronene with beliefs in traditional cosmologies who is always connected to spirit possession and ancestor spirits in his everyday life. In another study of small-scale mining by Kahayan miners in West Java, *jinn*, spirit owners, are involved in gold mining and *jinn* request *wadal(S)* (sacrifices) to reveal more gold to the miners (Soemarwoto & Ellen, 2010, p. 235).

In Aswan and William's traditional cosmology, *jinn* not only guard the gold but they also influence people's intentions and morality. Local morality in Bombana gold mining, dictates that people who want more gold to have to maintain good intentions (*niat baik*), a good attitude (*sikap baik*), and good behaviour (*tindakan baik*) to be able to procure more gold *rezeki*.

Aswan and other Bombana residents, most of whom are Moronene, Buginese and Muslims, believe that good *jinn* and evil *jinn* can control gold. *Jinn* likes to engage with good people or perform noble deeds and exhibit good manners. The *jinn* pose negative consequences

for miners, threatening them with risky conditions. As God's creatures, the *jinn* can detect people's intentions and prevent them from engaging in negative behaviours and attitudes. *Jinn* can guide someone to a mine and hide the gold from those who do not follow the written and unwritten rules. Meanwhile, good *jinn* (*jin baik*) can motivate people not to cheat or engage in risky behaviours and lead them to maintain positive intentions when prospecting for gold.

Residents' beliefs in Bombana gold mining are similar to the documentation about good and bad *jinn* among Bima Muslims, and lousy *jinn* as evil (*syaithon*) (Sila, 2014, p. 119). I heard people in Bombana say that excellent *jinn* live as good people do—they pray to God, eat, marry, and have everyday lives just as humans do—while the lousy *jinn* live like bad people. They can see people and visible creatures, but people cannot see them.

Moreover, Aswan and William say that *jinn* can also control thoughts and feelings, such as detecting people's purposes or intentions (*niat*) in mining gold (see Aswan's vignette above). Both Aswan and William reasoned that the intention to find gold as *rezeki* should be pure. *Rezeki* is a consequence of positive intentions, such as to find gold for money to buy basic needs (*sembako*)⁴ or to help one's family in moral and conscientious ways, such as paying school fees or medical expenses. People looking for gold *rezeki* need to focus on positive purposes and not hostile or improper intentions, such as satiating a dirty mind.

Gold is associated with supernatural creatures such as *jinn* and ancestor spirits and spirit possession. Bombana residents perceive that *jinn* can control events such as tunnel collapses, a belief also found among Kahayan people (Soemarwoto and Ellen, 2010). The belief in evil *jinn* is comparable to the belief among Bolivian miners in *Tio* who promote rebellious feelings (Nash, 1972; 1979) and also stimulate 'hot money' (Znoj, 1998; Walsh, 2003) and bitter money (Wethmann, 2003). The Bombana community believes that gold linked with *jinn* promotes hot money (*uang panas*). They consider all money collected from mining-related activities *rezeki yang panas* (hot *rezeki*), hot money, or fast money. The concept of hot money is associated with *uang haram* (forbidden or illegal money). Hot money promotes a morally negative state in the individual or causes a negative situation for the community.

On 29th May 2015 in Wumbubangka village, I had an informal conversation with Samran, the village head. He informed me that gold is *rezeki* but it is hot *rezeki* (*rezeki yang panas*). He declared that any money *rezeki* that people generate from gold mining is considered

⁴ *Sembako* (*Sembilan Bahan Pokok*) consists of food and drink, which are rated as the main needs of Indonesian people. According to Surat Keputusan Menteri Industri dan Perdagangan No.115/mpp/kep/2/1998 on 27th February 1998, the *Sembako* listed in order of importance are: rice or sago, corn, vegetables and fruits, meats (cow and chicken), milk, sugar, iodized salt, cooking oil and margarine, and the last are kerosene and gas/LPG (www.organisasi.org).

hot money. According to Samran, 'When I was a miner, the money cannot stay long in my pocket, and it always found ways to be spent on anything; for example, bad things would happen, and I needed to pay all the costs of that. The money only stayed for a while in my pocket, then it was gone very fast. If I got money from mining, I would spontaneously buy anything'.

The terminology of hot *rezeki* (*rezeki panas*) is also associated with the false prosperity (*kemakmuran yang semu*) that mining brings to the community. On 5th January 2015, I met a local farmer named Sudirman, a Moronene man who recalled that life was good (*hidup sangat enak*) for the villagers during the gold rush from 2008 to 2010 compared to their previous poverty. However, this is no longer the case. Sudirman said: 'See what hot money from mining is doing to us; now life has gone back to the old days before the gold mining. We are still poor'. He perceived the gold as hot money as it brought a false prosperity to the village, particularly for the indigenous Moronene. He argued that mining could not end poverty in his poor village community of Rau-rau, including the Rarowatu sub-district Bombana, which is still considered a poor mining area. Sudirman considered that gold mining only offered temporary prosperity for the villagers, as they are still trapped in poverty.

Most Bombana miners and non-miners have views similar to the Rejang people of Sumatra (Znoj, 1998, p. 201) regarding the terms 'hot *rezeki*' and 'hot money' in mining. Gold is hot money as it is easy to obtain and dispose of. Bombana people associate hot money with negative consequences for individuals and the whole community. It can drive people to engage in risk-taking behaviours or socially unacceptable activities, such as prostitution, gambling, drinking alcohol, polygamy, extramarital liaisons, and abandoning families. The Bombana people's perceptions of hot money are similar to those found in Bolivian mining communities, for whom hot money is money from *Tio*, the devil, which cannot stay long in the pocket (Nash, 1978, p. 224). In a similar vein, hot money in Madagascar, is believed to promote 'daring consumption' to fulfil immediate desires (Walsh, 2003, p. 290). When I visited the Roko-roko mining sites, I observed miners consuming alcohol and heard they conducted secret gambling through cock fighting (*sabung ayam*) and playing billiards (*bola sodok*). Most villagers believe those behaviours are provoked by hot money or hot *rezeki* influences.

In Bombana both women and men tend to engage in risky activities when involved in hot money or hot *rezeki* from mining activities. However, males were more prone to risk-taking behaviours resulting from hot *rezeki* or hot money. This finding is similar to what Znoj (1998) found among the Rejang and what Walsh (2003) found among the Madagaskar. They discovered that hot money promotes negative behaviours among men. However, in Bombana,

the effects of the hot *rezeki* from gold are also experienced by female miners. On 20th January 2015 Rosnia, the wife of Rau-rau village head village called Ibu Desa, told me a sad story of her female neighbour. The woman divorced the husband and pursued a male miner she had met in the mining site. Ibu Desa argued that her female neighbour's money from mining had 'closed her [female neighbour's] heart' (*menutup pintu hati*) and removed the love she felt for her husband. She also revealed gossip spread concerning some female miners who became 'invisible' prostitutes in mining sites who pretended to be food vendors (*penjual makanan*) or miners. Rosnia argued that females engaged in sinful behaviour because of hot money from gold mining.

Bombana people recognize money earned outside gold mining activities, such as farming, as cold *rezeki* (*rezeki yang dingin*). In our conversation on 5th January 2015, Sudirman articulated that such cold money promoted stable livelihood and security for the community. Sumatran miners also believe that any income gained from agricultural activities is cold money (Znoj, 1998, p. 204).

Maximizing *Rezeki* and Managing the *Bala* (Risk) through Traditional Rituals and Calculations

I recall one fine morning on 13th October 2015 when my relative, Mama Aswan (Aswan's mother), asked me to accompany her to *Kakek* Doma's (Uncle Doma's) house to attend the *Mewuwusoi* ritual (See Figure 2.1). Among the indigenous Moronene and the wider Bombana community, *Kakek* Doma⁵ was a well-known *tompuroo* (*M*) (rice Shaman) and *tolea* (*M*) (traditional healer and ritual leader). At his purported age of 100, many people still asked him for help in customary rituals such as weddings and circumcisions. On that day, I observed him leading the *Mewuwusoi*⁶(*M*) ritual conducted before people started harvesting rice (*memanen padi*) and before starting a new rice planting season (*tanam padi*). In every ritual, people always expected him to pray to God to bless them to get more *rezeki* and avoid *bala* (*memohon banyak rezeki and terhindarkan dari bala*). In the ritual, he also prays to receive

⁵ *Kakek* Doma passed away in 2016

⁶ (Limba, Widayati, La Ola and Suyuti, 2014) note *Mewuwusoi* (*M*) is a purification ceremony for any forbidden acts or *upali*(*M*) enacted by farmers to ensure they will stay healthy and able to continue their activities in the coming year with fruitful results.

blessings from God, the guardian spirits of nature called *nteiwonua (M)*, including *jinn*, to permit them to carry out activities in the next rice planting season.

Kakek Doma stated that *rezeki* is always positive and what people desire and expect to receive. However, people also want to be protected from danger or unwanted negative situations or risks known as *bala*. To maximize *rezeki* and prevent *bala*, Bombana people, especially miners, perform specific rituals. These are forms of traditional rituals well-known among the Bombana miners, including gift-giving, mediumship, and predicting good and bad days for mining, as I will explain in the following sections.

Sidestepping *Bala* (*Menolak/Tolak bala*) Traditional Concept of Risks

The term *bala* is well-known and commonly mentioned in Southeast Sulawesi, including Bombana. Its meaning encompasses danger (*bahaya*), bad luck (*sial*), something annoying, unlucky, and bringing unhappiness, insecurity, misadventure, or mischance, and indeed any harmful conditions that potentially threaten physical, social, and mental states. *Bala* refers to risk or hazard and danger incurred from any activities. Bombana residents interpret *bala* as any form of hazard or risk that can come from the God, *jinn*, or spiritual possession. They also believe *bala* resulted from *karma* (meaning what goes around comes around).

According to the *KBBI* (Sugono et al., 2008, p.123), *bala* is a noun that means *malapetaka* (disaster or catastrophe), *kemalangan* (misfortune), and *cobaan* (trial), *kemalangan* (unlucky), *kesusahan* (trouble), *kecelakaan* (accident) and *kesengsaraan* (misery). The word *bala* is primarily used in the collocation of '*tolak bala*' which means any effort conducted to sidestep (*menangkal*) any kind of disaster (*bencana*), danger (*bahaya*), or disease (*penyakit*) through traditional rituals such as *kenduri* (ritual feast) (Sugono et al., 2008, p.123 and p.1745).

Bala implies risk, hazard or danger, the potential negative consequences that are the concern of cultural risk theory (Douglas and Wildavsky, 1982). *Bala* relates to the consequence of someone's sin or transgression (Douglas, 1992). *Bala* concept is very close to the concept of morality (Douglas, 1992, p.3). *Bala* also indicates issues of purity and danger (Douglas, 1966) that involve ritual cleanliness, magic, and miracles.

Thanksgiving (*Syukuran*), *Mooli* (M), and *Mobeli Wonua* (M): Gift Exchange and Reciprocal Gifts

The practices of cultural rituals such as celebration of thanksgiving (*syukuran*), *mooli* (M), *mowuwusoi* (M), and *mobeli wonua* (M) are well-known among local Bombana people and migrant miners. These traditional practices involve gift-giving and gift exchange (Mauss, 1990) from people to God, *jinn*, or ancestor spirits. People expect a reciprocal gift from them in blessings, *rezeki*, positive outcomes and protection from risks or *bala*. These cultural rituals require the mediumship of scarification, for example, foods, live and dead cattles, cattles' blood, tobacco, etc. However, the notions of mediumship and gift-giving in *syukuran*, *mooli* (M), and *mobeli wonua* (M) are slightly different.

Syukuran or thanksgiving (See Figure 2.6) is a familiar ritual practised by people. *Syukuran* comes from the Indonesian word *syukur*, which means grateful or content and denotes a thanksgiving ritual for blessing. The *syukuran* is mainly conducted to celebrate an achievement or mark the first step that someone takes in an endeavour. In Bombana, this ritual is conducted to seek God's blessing and prevent risk at the mining site. The rituals are an individual's choice, and are closely related to the cultural and religious beliefs. The *syukuran* use foods such as rice, meat, or fish, traditional cakes, and *dupa* (incense) as mediumship of offering to God. People make *dupa* from burning sugar on a plate filled with charcoal to produce smoke. The imam (the head of *syukuran*) use *dupa* as a medium to communicate with God and spirit possessions. Someone regarded as *orang tua kampung* (a respected person in the community) can lead the ritual of *syukuran*.

The concept of *syukuran* is consistent with the 'potlatch' system of gift exchange, feeding, and consuming (Mauss, 1990, pp.6-7). People in Bombana believe smoke can invite the spirit and their ancestors to join the ritual and enjoy the feasts provided. *Syukuran* is also known as *baca-baca* in the local dialect. In mining activities, people celebrate *syukuran* when they open up a new mining site as a thanksgiving to God, who has blessed them with plenty of gold. Migrant miners use the word *syukuran* to pray for more *rezeki* and chase the *bala* away. Pak Olong, a migrant miner in Roko-roko, revealed that he tended to invite his own religious or cultural spiritual *guru*—called Pak Imam—from his hometown in South Sulawesi, to lead the *syukuran* for his family. Pak Olong provided transport and miscellaneous gifts as payment to Pak Imam during his visit to Bombana.



Figure 2.1. The event of thanksgiving (*syukuran*) to *cerra* (*M*) our new car in Bombana. There was a *tolea* (*M*), who lead the prayer. There was also some food arranged in the middle of the circle of people, including a young coconut and incense smoke (*asap dupa*)

Mooli (*M*) is a well-known Moronene ritual that can be seen as the local version of thanksgiving (*syukuran*) (See Figure 2.2). For many generations, the Moronene people have been practising the *mooli* (*M*) ritual (Mead, 1999; Arafah, 2002; Limba et al., 2014; Limba et al., 2016). Traditionally, this was an essential agricultural ritual, an occasional ritual intended to get permission from *jinn*, good deities or spirits who guard a particular piece of land before people open it up for agriculture (*berkebun*) such as planting rice or trees. Initially, the *mooli* (*M*) ritual was held remotely in a sacred jungle area. *Kamutaa* (*M*) (*dukun*), traditional healers, can help *tomporo'o* (*M*) (village community leaders) to prepare equipment and materials for the ritual—such as tobacco, Moronene leaves (a distinct plant used by the indigenous Moronene), food, and a set of clothes—as sacrificial materials for the good deities or *jinn* who guard the land.



Figure 2.2 The steps of the *Mewuwusoi (M)* ritual in Kakek Doma's house

The *mooli (M)* ritual, initially conducted among the Moronene people has been adapted by the Moronene and migrant people to be performed in the context of gold mining. Some Bombana residents conduct the ritual only on the particular land (*lahan tambang*) that will be mined (*diolah/di tambang*). Landowners (*pemilik lahan*) conduct the *mooli (M)* rituals if they want to carry out either mining or agricultural activities (*olah*) on their land (*lahan*). They will contact a *tolea (M)* (*orang tua adat*) or the customary *adat* leader in their Bombana neighbourhood. People will sacrifice clothes and live animals as part of the ritual. Some miners prefer to conduct the *mooli (M)* ritual simply. Sometimes, only the owner of the *dompeng* (crushing machine), and the *tolea (M)* attend this ritual.



Figure 2.3 The steps of *Mooli (M)* rituals

On 2nd January 2015 I interviewed Sukmawati, the owner of a *dompeng* in Rau-rau. Sukmawati told me that the first time she operated her *dompeng*, she invited Kakek Doma as a *tolea (M)* or *kamuta'a (M)* to offer ritual prayers to God to receive a blessing. The *tolea (M)* conducted the ritual in the middle of the land to place her *dompeng* machine. She requested that the *tolea (M)* ask God for more *rezeki* and to prevent risks (*bala*). The first time she conducted a *cerra(M)* ritual or purification *mooli (M)* for her *dompeng* machine, she sacrificed a cow and spilt the blood at her mining sites. She firmly believed that the offering of blood would encourage the *jinn* to reveal more gold. Then she asked the *tolea (M)* to request the *jinn* that guarded the gold veins to reveal more gold to her employees (*anak buah*). She asked the *tolea (M)* to place a spell on her machine so that nobody would steal it when it was left in a remote mining site without a security guard. This stage can be done through rituals such as *syukuran* or *mooli*.

On 15th October 2014, I received further information from Pak Zubair, one of the Moronene *adat* leaders who lives in Rau-rau village, when I attended the *syukuran* of hair cutting (*potong rambut*), a ritual to express gratitude to God for the birth of a newborn baby. He explained that another mass *syukuran* is the *mobeli wonua (M)* ritual. In this ritual, it is compulsory to sacrifice animals, such as cows or chickens, depending on the individual's financial ability. If people can afford to, they will sacrifice large *halal* animals such as cows (pigs are not considered *halal* among the Bombana Muslim population). People with less money would only sacrifice a chicken. *Kamuta'a* or community leaders (*tokoh masyarakat*) can lead the ritual. The descendants of the *mokole (M)* (the king/ruler among the Moronene) or a religious or government leader can also lead the ritual.

Other *adat* processions that follow the *mobeli wonua (M)* ritual are *montehi wonua (M)* and *weanganga (M)*. *Montewehi wonua (M)* ritual is an *adat* ritual that aims to purify the Bombana land (*penyucian negeri*) and to prevent *bala* happening on the land (*tolak bala*). Then it is followed by the *weanganga (M)* ritual, a symbolic ritual conducted by families and relatives of the elders of Moronene to fulfill their vows.

Figure 2.4 Several photos of Mobeli Wonua Ritual. Photos credit to Omar Pidani





Bilangari (M), Kilala (M), and Kalapuario (M): Timing and Compass Calculations

As well as conducting sacrificial rituals to gain more *rezeki* and escape *bala*, some local Moronene miners have traditional methods (*bilangari (M)* and *kalapuario (M)*) to calculate the best time to mine. (See Figure 2.3, 2.4, and 2.5). Based on local indigenous knowledge, these calculation methods employ exotic and distinguishing emblems and symbols to mark good and bad days for mining. Although these techniques do not require any sacrifices, there are moral and ethical criteria attached to following the rules with these calculations. These symbols are different from the Buginese symbols of calculation.

Bilangari (M) is a counting strategy used to decide when it is a good day and an excellent time to conduct certain vital events for the individual or community. Some people describe *bilangari (M)* and *kotika (M)* as a board approximately 7x5cm and 0.5cm thick. It contains all the information for one to seven days and the meanings or consequences of going out on certain days. For example, *Rea (M)* (*darah*) or blood means becoming a king, winning, and being successful; *laba (M)* (*untung*) means receiving something valuable (profit/blessing/fortune/good luck and good fate); *sala (M)* (*road*) means a long road ahead, black and tall; *bolo (M)* (*lubang*) means death, hole, *sial* (bad luck), and short; and *lino (M)* (*terang*) means pure and lost (Rambe, 2012; Limba et al., 2014; and Limba et al., 2016).

Kalapuario (M) is a Moronene calculation that uses the points of the compass to trace any lost property or to guide the miner to an excellent location to commence essential activities. *Kilala* is Moronene knowledge used to obtain hints about safety, health, and luck. It can predict if someone is in danger or sick or can be used to indicate spiritual beings they can ask to cure a disease or save them from peril (Rambe, 2012; Limba et al., 2014; and Limba et al., 2016).



Figure 2.5 Moronene's *Bilangari (M)* calendar for farming



Figure 2.6 Moronene's *Bilangari (M)* for choosing good days

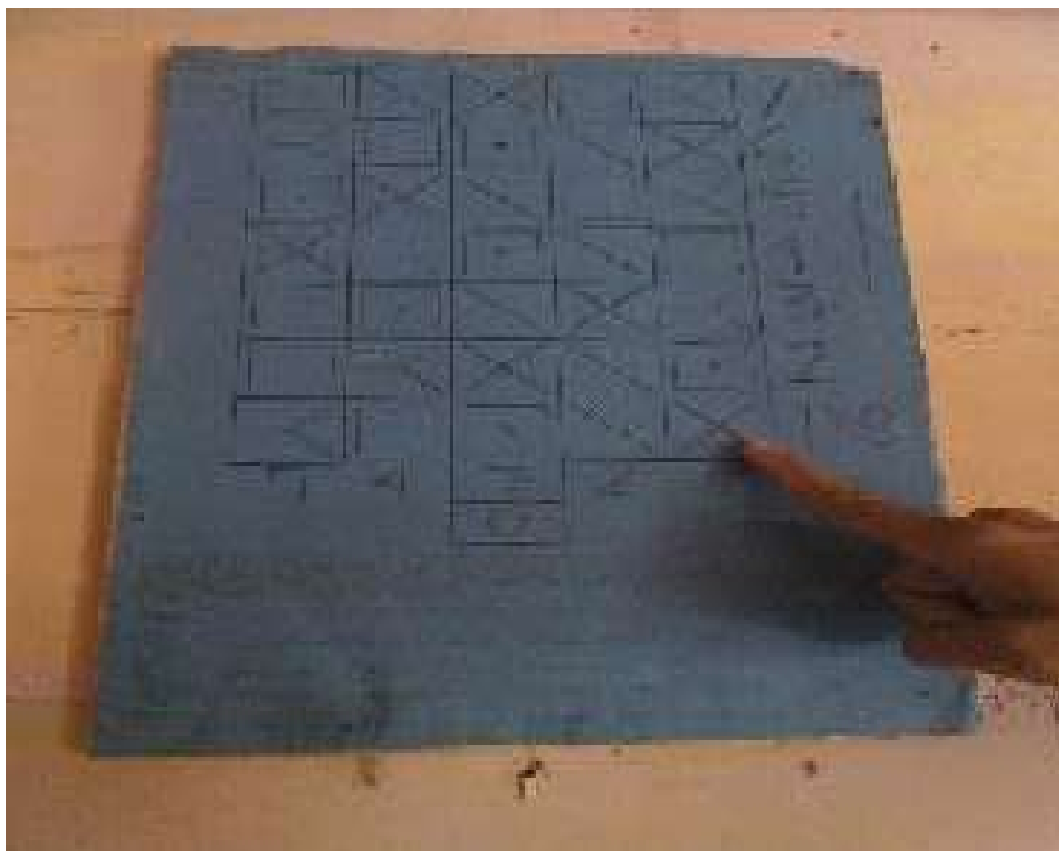


Figure 2.7. *Bilangari(M)* calculation diagrams

The concepts of *rezeki* and *bala* which are widely used by people in Bombana reflect the strong influence of local Islamic practices that have accommodated to beliefs that predate Islam. Moronene cultural values dominated the life of the Bombana people even if they originated from other parts of Indonesia (including as Buginese, Tolakinese, Javanese, Balinese and Munanese). The local values were reproduced in everyday life, especially through the conduct of rituals to protect miners. For this, the miners performed the Mewuwusoi (M) ritual derived from agriculture. They also used practices based on Moronene culture to select auspicious times for mining activities. While these Moronene traditional practices concerning *rezeki* and *bala* have been subsumed into a body of practice that is identified with Islam, migrants who professed Christianity, Hinduism and Buddhism also followed these rituals.

However, most people in mining areas no longer claimed used traditional method of predicting good timing for mining activities because they mined on a daily basis. Also, these practice requires payment to a ritual specialists. Anyone engaging the services of mediums or practitioners in these arts must give money sincerely (*pemberian seikhlasnya*) to *tolea* who can perform *bilangari* and *kalapuro*.

On 15th October 2014, during the *aqeqah* or hair cutting (*potong rambut*) celebration of his wife's baby nephew, Pak Desa told me that most younger miners and migrant miners do not believe in traditional methods of predicting timing such as *bilangari* (M). He showed us the calendar of *bilangari* (M) calculations (see the picture in the last section).

This customary scheduling method is only considered when someone has a new *dompeng* crushing machine to be set up at the mining site and the owner can afford to do the ritual. On 2nd January 2015 I interviewed Sukmawati, also known as mama Sukma (the mother of Sukma). She revealed that when she wanted to set up her new machine, she asked for one of the Moronene community leaders or *kamutaa* (M) to calculate and decide the best day and time to bring her machine to the mining location. *Kamutaa* (M) told her the best time was early on a Monday morning before the sun came up, around 6.00 am. If she did not go at that time, she would not gain any benefit from her machine, and there would be a lot of bad luck, risk, and danger lying in wait for the machine. She could avoid danger by going out early or skipping the unlucky day or time.

Sukmawati like most Moronene observe these traditional timings as these traditional values have been embedded in their lives for many centuries. Other Bombana residents also follow this in mining activities. Their beliefs about timing have contributed to shaping their morality, and they follow the timing allowed or not allowed to start an activity. Their morality influences their attitude to decide what is or is not risky timing. These traditional timing

methods can determine risky opportunities. As Zigon (2008) argues, anthropology includes all cultural and religious aspects of an individual's life; I argue that all traditional values—including the rituals and traditional knowledge of timing, such as *bilangari (M)* and *kilala (M)*—make essential contributions to the morality. Through these rituals, people are expected to maintain good ethical standards according to cultural and religious values.

People believe that by conducting such gift-giving and mediumship rituals and making the proper calculations the first time they set up any activities related to mining, they will receive an abundance of luck (*murah rezeki*) and push the *bala* away (*menjauhkan sial*). However, they should also maintain good morality and correct conduct when performing those rituals.

Those rituals involve mediumship, such as food, that supports the people to pray to God and *jinn* and the spirits. The ideas of sacrifice and gift-giving in mediumship rituals reflect Mauss's (1990) theory of 'God's gift', particularly as '*reciprocal gifts*' (cited in Douglas, 1992, pp. 158-159). The miners who conduct these rituals can enjoy the fruits they present to the *jinn* and the spirits in those particular rituals based upon the ideology of reciprocity. This give-and-take behaviour towards *jinn* and God aligns with the concept of commodity economy derived from Marx (1868) (cited in Germer, 2005, p.21), which Mauss (1990, p.10) translated as gift economics in his theory of reciprocal obligation. People put their time, money, and effort into completing all the requirements of a particular ritual, expecting God or *jinn* to answer their prayers. In addition, people offer food to the *jinn*, and *jinn* can give them something they need in return; for example, people wish that the *jinn* who guard their farmland will not create problems while farming. When people sacrifice animals or offer food in rituals, they demand reciprocal gifts from God, *jinn*, and spirits in the form of a blessing for *rezeki* and keeping away the *bala* or risks. Consequently, the expressions 'praying for more *rezeki*' and 'avoiding *bala*' apply to several abovementioned activities. People pray for God's blessing and express their gratitude while wishing for better living conditions.

Conclusion

The motivation to obtain money has driven people to engage in mining in Bombana (Zulkarnain, 2010; Pudjiastuti, 2010 cited in Zulkarnain, 2010; Mokui 2015; Pidani and Mokui, 2017). However, there are other reasons, which I label as semi-moral-economic motivations, for Bombana people to participate in mining, such as seeking *rezeki* from God in the hope

(*harapan*) of changing their fate (*nasib*) (Zulkarnain, 2010, p.3). Indeed, I argue that the driving motivation for people to engage in any kind of risky activities in Bombana mining is the traditional cosmological beliefs, religious and spiritual, of looking for *rezeki* to eke out a livelihood.

Gold *rezeki* resembles God's gift (Mauss, 1990) for Bombana people to sustain their livelihoods. This gift comes in many forms, both material and non-material. I argue that the notions of *rezeki* from God perceived by migrant miners and farmers, including children and women, exclusively underpin their motivations to mine for gold. Indeed, their expression 'looking for *rezeki*' is related to what Acciaioli (2004, p. 149) noted about the spirit of '*masappa dalle* ', meaning 'searching for good fortune', among Buginese migrants in central Sulawesi. The words imply constant effort to seize good fortune (Acciaioli, 2004, p. 179). Miners' expressions and explanations about *rezeki* also relate to the phrase 'to look for their fortune', similar to what Wallace (1962) studied among the Bazar Malay.

In order to maintain the availability and sustainability of gold as God's gift, people aim to practice good morality according to religious values and Bombana socio-cultural values, but not necessarily good environmental practices. As Zigon (2008, p.2) noted that morality is conflated with socially-approved habits, and the morality of Bombana society is used to interpret people's motivations to look for *rezeki* as their good intentions to sustain their livelihoods. This morality is seen as an excellent moral compass based broadly on religious and cultural values (Csordas; 2013, p. 526). It is clear that moral involvement related to culture and religion plays a crucial role in these mining efforts. Some miners in Rau-rau will still be satisfied even if they do not find anything for a long time, and they see it as a journey, practicing a moral life, and not merely a profit-oriented effort.

After o=cMaintaining morality is not only aimed at gaining more *rezeki* but is intended to avoid harm and manage the negative risks in local mining, called *bala*. The term *bala* corresponds with the notion of risks and danger that Douglas and Wildavsky (1982) noted as fluid terms for negative consequences in their cultural risk theory. Just as Kleinmann (1999) argued that perceived dangers would order the moral processes in a society, it is clear that the conception of *bala* is determined through the lens of morality according to Bombana culture. Here, Bombana miners will likely maintain a good moral compass to sidestep *bala* (*menolak/tolak bala*) or risk that threatens their revenues generated from mining activities.

Despite constructing perceptions around gold and its agency, miners also negotiate their identity, adapt to the challenging mining environment, and struggle with social issues.

Chapter Three

A Hard Battle (*Berjuang Keras*) for Livelihoods: Identity, Mining Methods, and Social Issues

On a sunny 25 October 2014, I visited the Tahi Ite hamlet. I met Pak Sulaiman, a Butonese man who lived with his wife and three children in his modest bamboo stilt hut with a blue tarpaulin roof. During our conversation, he emphasised that as a miner, he must fight hard for the livelihood of his family (*berjuang keras untuk hidup keluarga*), because the nature of mining work is very challenging (*sangat berat*). He believed that his life was a hard battle (*berjuang keras*), looking for *rezeki* (see chapter two) to support his family's livelihood. He was also concerned about social unrest, for which he used the term *penyakit masyarakat* (social issues) around the mining sites where his family worked and lived.

My study employs an anthropological approach that posits miners as collective agents with various assets or capitals, including economic, social, and cultural (Bourdieu, 1986). I used data from surveys (quantitative) and interviews (qualitative) as well as field observations. This thesis explores a range of issues that Pak Sulaiman and other miners encounter in sustaining livelihoods and risks in the Bombana mining area. This study interprets development studies by scholars (Bebbington, 1999; 2000; Bebbington et al., 2008; Moser in Dani & Moser, 2008; Scoones, 1998; 2009), who have defined livelihood as not limited to obtaining the necessities of life, such as housing, food, and clothing. Instead, livelihood is a dynamic term referring to a function of assets and structures, and a source of subsistence, income, identity, and meaning' (Bebbington et al., 2008, p. 2890). Consequently, my study examines miners' perspectives on livelihood issues about constructing a living and making it meaningful (Bebbington, 2000, p. 498). I also include the concepts of knowledge, politics, scale, and dynamics as key livelihood issues (Scoones, 2009, p. 171). Term 'assets' in the context of development studies—such as human capital, social capital, produced capital, and natural capital can be simplified by integrating natural and produced assets into economic capital; social capital retains the same meaning (Bebbington, 1999; 2000; Moser in Dani & Moser, 2008; Scoones, 1998; 2009). However, human capital constructs cultural capital (Bourdieu, 1986).

This chapter explores the political identity issues that the locals and migrant miners encounter in their daily interactions in the mining settlements. In addition, I describe their mode

of coexistence in the blue tarpaulin camps, where most miners live and participate in various mining activities. I also explain the various modes and labour divisions of mining engagements. Finally, I describe the diverse social issues in Rau-rau mining society.

The Oil-Water Relations: Local and Migrant Political Identities

Politically, the local village's regulations and administration split people in the community into two distinct groups: 'local' and 'migrant people'. The village government recognises local people as those residing in the village, listed by the administration as local people, and who possess the village identity card (*Kartu Tanda Penduduk/KTP*) of Rau-rau, which marks them as local Rau-rau residents. I heard from Pak Desa that there is an unspoken or unwritten rule (*peraturan tidak tertulis*) among Rau-rau society that migrant people who have resided for more than three years and have bought land in the village, can be granted local residency.



Figure 3.1 The Rau-rau village office

In their everyday lives, people in Rau-rau distinguish their identities as local residents (*penduduk local*) or migrant/incoming residents (*penduduk pendatang*). Most residents are indigenous Moronene and most migrant residents are Buginese. Some migrant residents are Javanese, Tolakinese, or of other ethnicities. According to their mining activities, people were

identified as either local miners (*penambang lokal*) or migrant miners (*penambang pendatang*). Local miners are people who live permanently in the village and go back and forth to the mining sites. In contrast, migrant miners are those who come from outside Rau-rau village, including from other districts in Bombana such as the Poleang district; from parts of Southeast Sulawesi such as Kolaka, South Konawe; and from other provinces in Indonesia such as South Sulawesi, Kalimantan, Ambon, and Java.

Migrant and local people mark their communal identities through preferences in dwelling location. Most local villagers, primarily Moronene people, live along the main Rau-rau roads. In contrast, the migrant people in the village, primarily Buginese, kept themselves separate from the locals. They preferred to live around the three road junctions of Rau-rau, locally called intersection (*simpang*) or crossbar (*palang*). They have built their mosque and Friday sermons are delivered in the Buginese language. Some other migrant miners reside in the blue tarpaulin (*tenda biru*) mining camps due to their ease of access to the mining sites. These mining settlements are located on the outskirts of the village. The locals and migrant people acknowledged that they prefer to be neighbours with those who speak the same mother tongue because they can easily ask for help (*mintu bantuan/mintu tolong*) and have common moral and religious values.



Figure 3.2 The main road in Rau-rau village, along which most local villagers' houses and paddy fields are aligned

People in Rau-rau village define their identity as a mutual relationship that indicates similarity within oneself or selfsameness (Erikson, 1959; 1980). This preference for self-sameness terminology is called self-consciousness of identity (Cohen, 1994, p. 11). Both local and migrant people perceived their identity as a cohesive group or collective individuals. They struggled to maintain a viable and coherent group and ‘formed their concept of self-endowed with reflexivity and agency’ (Sökefeld, 1999, p. 147).

The production of local and migrant identities is embedded with political ramifications (Sökefeld, 2001, p. 542), resulting in a politicised cultural identity (Cohen, 1993, p. 199). Indeed, the term livelihood blends identity politics and livelihood practices (Bebbington, 2000, p. 498). This inclusion of political identity (Sokefeld, 2001, p. 527) implies not only segregation between two groups, locals and migrants, but also the struggles of some to access resources provided by the government. Cuypers (2001, p. 8) argued that self-identity and personal autonomy are factors that generate images of personhood. While self-identity refers to personal descriptions of metaphysics, morals, and emotion (Cuypers, 2001, p. 8), personal autonomy means the ability of individuals to care about themselves (Cuypers, 2001, p. 8). In addition, Williams (2008, p. 63) claimed that autonomy constitutes power and resistance in anthropological studies.



Figure 3.3 The junction (*simpang*) or crossbar (*palang*) of Rau-rau main road to the Poleang district, where most Buginese migrant miners, stall vendors and gold buyers live

Individuals labeled as local people (*orang lokal*) have greater personal autonomy (Cuypers, 2001; Williams, 2008) than migrants because they can access any subsidised necessities provided by the local and national government. Migrants, on the other hand, have difficulty accessing those facilities, and express resistance to the local government, thus politicising their identity.



Figure 3.4 Female villagers in Rau-rau purchased 3kg gas and subsidised brand new gas stoves from the central government

Local people have the autonomy to access any village benefits by using their identity card, KTP. Several national programs have benefited the Rau-rau local villagers. For example, a national program called Free Gas Stove (*Kompur Gas Gratis*) encouraged Rau-rau villagers to substitute their kerosene stoves with gas stoves. Another social program was *Beras Miskin/Raskin* (Rice for the Poor Program) from the Social Department, which subsidised rice for the poor villagers at a low price. There was also the National Community Development Program-Rural Independent (*Program Nasional Pengembangan Masyarakat/PNPM-Mandiri*

Pedesaan), called The Saving and Credit Programs for Women (*Program Simpan Pinjam Perempuan*). The PNPM project distributed loan money to women in the village of up to *sepuluh uta rupiah* (Rp.10.000.000, approximately AUD 1,000) per person to support small-scale businesses such as grocery stalls (*warung sembako*) or kiosks selling essential commodities.

In the struggle to gain access to these benefits from the government, most migrant miners are also trying to politicise their identity status to gain more autonomy (Cuypers, 2001; William, 2008). I witnessed a local man from East Java asking the Village head to grant his nephew a domicile card (*kartu domisili*). The card was temporary proof of residential identity, and people used it in the preliminary process to obtain a *KTP*. The man was trying to trade his cultural and social capital (Bourdieu, 1986, p. 82) as the only Madurenese person who has been living the village for more than twenty years (now considered a local villager). Pak Desa revealed that this man could support him in the next head village election. The man wanted his nephew to obtain a temporary identity letter to be recognised as a local because locals can claim many benefits from the village administration, such as subsidised rice.

However, William theorises that, in the mining sites, autonomy, power, and resistance are less likely to be attributed to local and migrant people. Both migrants and locals have the same autonomy to gain access to mining activities. Local people have power to authorise their powers to migrants to embrace the same power in accessing mining activities, for instance a land owner, named Lamaku gave full authority to a migrant Chinese man, named William to embrace his power in maintaining mining activities in the owner's land in Padambila.

I observed equal opportunities in autonomies embraced by local and migrant people in the Padambila mining site. I met William, the only Chinese Javanese in the area. He operated a mining site belonging to Lamaku, a Buginese mining landowner, living in Bambaeya village next to Rau-rau village, who gave authority to William to manage his mining sites. William revealed that he had already welcomed locals and migrants to work at the mining site. William admitted that although most miners came from different places, there is unity in diversity (*berbeda-beda tetapi satu*) in the Padambila mining camp. He treated the miners in the camps like family and relatives, observing that '*Kami seperti keluarga tapi tidak akrab satu sama lain*' ('We look like family but [are] not familiar [with] one another'). He means that their view about mining is an equal place for everyone to work.

Modest Living in Blue Tarpaulin Tent (*Tenda Biru*) Settlements

People built temporary accommodation in the mining settlements, mainly blue tarpaulins (*terpal/tenda biru*). When viewing the Bombana areas on Google Earth, the blue areas indicate the zones of blue tarpaulin mining settlements. Most miners live, work, and shelter their families in these mining settlements.

There are several options for miners to build temporary shelters in the mining sites. Some local miners build small stilt huts, approximately 3x4 metres, with roofs and walls made from dried grasses. Most miners, mainly migrants, preferred to use blue tarpaulins to build their temporary tent accommodation because of their effectiveness and efficiency. Plastic tents are convenient and cheap. The price per tarpaulin ranges from 150 thousand rupiahs (approximately 15 AUD) to 400 thousand rupiahs (approximately 40 AUD), depending on width and quality. The broader and more robust the tent, the costlier it will be. However, most blue tents only last for around eight months. When miners build a shelter, they combine the tarpaulin with bamboo and timber. They mostly used tents as a roofing material. Bamboo will last longer, and miners can save money when building a shelter. Miners prefer to build stilt huts instead of making shelter tents on the grounds. They feel warmer in the bamboo huts than in the tents. In addition, the stilt houses protect them from attacks by animals, such as snakes.



Figure 3.5 Blue tarpaulin mining settlement in Padambila, outskirts area of Rau-rau village

Miners relied on water from nearby rivers, dug wells (*sumur gali*), and opened up inactive *rat holes* to find water to support their daily needs.⁷ Some miners also used water from the tailings and excavated holes⁸ for domestic purposes, such as washing and bathing. Most miners preferred to buy drinking water sold in gallon containers called water gallons (*air galon*). If the water gallons were delivered to the mining sites, the miners paid 10 thousand rupiahs (approximately AUD 1) per gallon. If they took the water gallon straight from the depots outside the mining areas, they would pay only half that price, 5 thousand rupiahs (approximately 50 cents AUD). The cost of transportation to and from the mining sites contributed to the high prices of water and goods. The roads were very muddy in the wet season (*musim hujan*) and very dusty in the dry season (*musim kemarau*). Although some miners were concerned about the poor water quantity and quality for domestic purposes—such as drinking, bathing, and washing—I observed that they kept using the water around the blue tents for their daily needs.

Some health professionals and media have claimed that poor personal hygiene and sanitation infrastructure in the environment where miners lived contributed to health problems and the spread of diseases. During my interviews with Tarsan and other environmental health professionals from the Bombana District Health Department, they argued that the primary sources of illness in mining areas were dirty water, poor sanitation, and non-hygienic living conditions. An online local news source, Liputan6 (2008), reported on a diarrhoea outbreak in December 2008—during the gold rush era—when 30 miners were hospitalised due to complications of diarrhoea.

Mining Methods and Division of Labor: *Dompeng/Kato, Jet, Tromol*, and Panning

Since gold was first found along the Kasutahi River located in Tahi Ite hamlet, mining methods have evolved, from (mostly) panning along the river to digging in the uphill areas.

⁷ Some holes are judged clean if the hole is not used for rubbish, or as a toilet contaminated by feces and urine. Indeed, the hole should have clean water in the bottom (*mata air hidup*), meaning that the hole produces continuous clean water.

⁸ These are abandoned holes that were once used for mining. Some look clean and clear, but most were contaminated by mercury. Some water had turned green because of algae, while some looked muddy and polluted by chemicals.

Miners can choose any mining mode according to their social and cultural capital, which is not only economical but encompasses all forms of capital (Bourdieu, 1986) to sustain their livelihoods.

Dompeng/Kato: Sluice Box and Large Machine Capacity

Miners with more financial capital chose to maintain *dompeng* or *kato* machines and are called *dompeng* bosses. The boss requires five to six staff, including a supervisor (*pengawas*), a water shooter (*penembak air*), a machine operator, and a cook. Most *dompeng* bosses and staff are men, while most cooks are women. Sometimes the machine owner appoints one person as the leader to supervise the workers. The *dompeng* machine techniques are almost the same as the sluice box techniques used in small-scale mining in Venezuela (Hinton, Veiga and Veiga, 2003, p. 101).

The *dompeng* or *kato* technique follows several steps: the jet machine sucks water from the ground and causes the water to flow through the designated area, locally called a hole (*lubang*). In this area, one or two miners will dig the ground with shovels to gather materials and ensure the soil is mixed with water. One or two men will hold the big hose to suck out the muddy water. One end of the hose is attached to the vacuum machine to suck, and the other is attached to small plastic containers placed on top of the *kato* or *asbuk* (timber sluice box). Miners interchangeably use the word *kato* or *asbuk* to refer to the sluice box. To catch the gold flux, the *kato/asbuk* will be placed at a 45-degree angle to ensure the water will pass over the carpet spread on the *kato*. The water is collected in a tailing dam made from a large plastic sheet.



Figure 3.6 *Dompeng* sluicing activities. The *dompeng* machines suck the water and distribute it through the pipes and hoses

Jet Machine: Sluice Box and Small Capacity

The jet machine (*mesin jet*) technique is another kind of pump of *dompeng*, and it is an unusual mining method for Bombana miners. On 12 November 2014, Sulaiman—who worked for the jet machine group—explained that the techniques used with the jet machine are almost identical to those for the *kato* or *dompeng* machine. However, the jet machine is smaller than the *dompeng* machine and has a limited capacity to mix the water with potential gold material. He also said that the operating costs of the jet machine were lower than the costs for the *dompeng* machine. The cost of a jet machine is around 5 million rupiahs (approximately AUD 500), which includes spare parts. The machine's owner only requires two or three people to operate the machine, so they do not need to spend too much money on living allowances for additional workers. The initial capital outlay for diesel oil and other materials is lower than for the *dompeng* machine.

After processing using *dompeng* and jet machines, miners who own the machines or trusted workers remove all the carpets from the *kato/asbuk* and wash them in clean water. The water is collected in a plastic tailing dam or a small designated hole. This process is called *cuci*

karpet (washing carpet). At this stage, the mercury will be used in the panning process to maximise the gold amalgamation.



Figure 3.7 *Asbuk/kato*/sluice box with carpet attached to catch gold flux

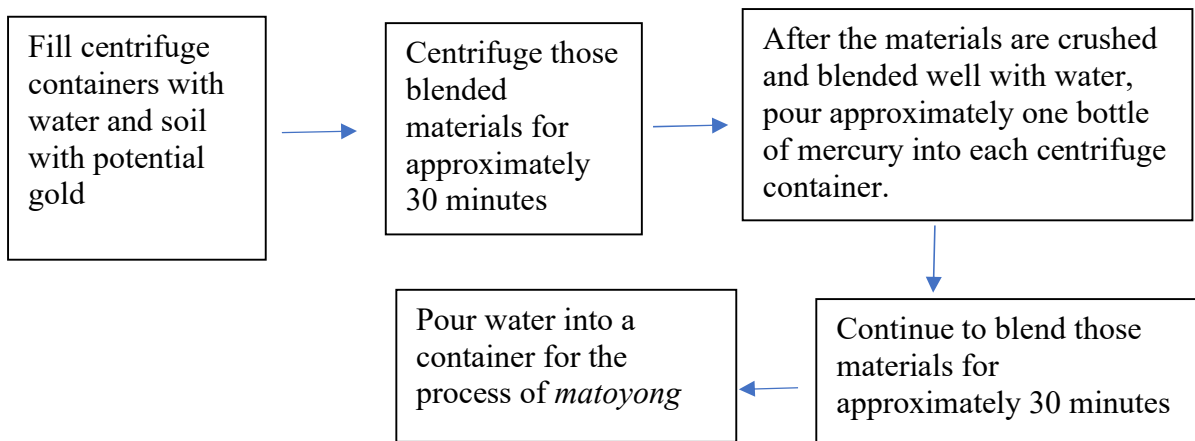
Using the trommel mill machine called *tromol*, a kind of centrifuge, mercury is added to produce amalgam and extracted to form gold. The trommel mill is a much larger mining machine and has attracted fewer miners because it is costly. For one machine, the price is approximately 50 million rupiahs (approximately AUD 5,000) for a secondhand machine and around 200 million rupiahs (approximately AUD 20,000) for a new model. Consequently, few miners can afford to purchase this machine.

A *tromol* is called *gelundung* in West Java (Ellen and Soemarwoto, 2011; Subiman, 2011). This machine has three main parts, each with unique functions, – mills, belts, and a generator to power the rolling belt mills. The generator uses approximately 50 litres per diesel fuel (*solar*) per day. The cost per day in 2008 was approximately 500 thousand rupiahs (approximately AUD 50) if the *solar* price is 10 thousand rupiahs per litre. Operational costs in addition to *solar* include machine spare parts and an operator's salary. The owner charges miners who use the service to blend their rocks and soil containing gold 50 thousand rupiahs per sack of raw materials to cover these costs.



Figure 3.8 This *tromol* machine belongs to William in Padambila mining site, used for grinding tailings *Tromol* Machine (*Mesin Tromol*): Mill, Centrifuge and Mercury

Chart 1. Gold processing chart using a trommel mill



Source: Fitrilailah Mokui'Observational data, 2015

The *tromol* machine requires various labour inputs, and the owner determines the number of labourers, their wages, and the techniques used. Practically, this machine requires one to three labourers. I closely observed William's *tromol* machine in the Padambila mining areas. He hired one experienced older man and one young adult as operators to ensure the drums (large cylindrical metal drums in which the materials, water and mercury, are placed)

were always in the correct position along with the belt. The third operator carried out the *matoyong* process. This is a local term for the process of amalgamation in which fine materials and mercury liquid are sieved onto plastic cloths and squeezed to form a ball or nugget of amalgam (see chapter four on mercury).

William bought the raw materials to process into gold, from people who came to him. He even offered me a job as a material collector, saying I would own any gold that I collected or I could sell it to him. People collect solid rocks that potentially contain gold, called vein rocks/gold vein (*urat emas*), from rat holes (See the next section). Others collect materials from excavated holes (*lubang eksa*) because they do not need to spend time and effort digging gold materials. William helps them by hiring an excavator operator to dig potential gold hills in Padambila. People can immediately gather soil or dig out rocks or make hollows to extract vein rocks that might contain gold. Miners need only a shovel and some sacks (*karung*) to collect material and bring it to where the *tromol* or *dompeng* machine is located.



Figure 3.9 William, the head of the Padambila mining area, speaking in English to my supervisor, Kathryn Robinson, about his mining area

William had appointed a young boy as an amalgam burner (*pembakar amalgam*). William himself was in charge of weighing the gold and paying the miners who asked for the gold with cash. If he ran out of cash, William gave the gold owner a receipt, and miners could collect the money the following day or later by showing the receipt as evidence.

Digging 'Rat Holes' (*Lubang Tikus*): Vertical and Horizontal Holes

Another mining mode is digging a shaft, locally called the ‘digging *rat hole* method (*metode menggali lubang tikus*), and miners who conduct these activities are called hole diggers (*penggali lubang tikus*). The rat holes can be dug vertically or horizontally, and the work organised individually or in a group. Vertical rat holes were mostly dug by groups of young men who considered themselves brave enough to get into deep holes to extract gold materials. According to my survey of around 200 miners, 95 percent of vertical hole diggers were men, while only 5 percent were women. In the case of horizontal holes, 80 percent of diggers were men, whilst just 20 percent were women. In the case of light jobs, 95 percent of women preferred to do light jobs such as collecting the remnants and crushing rocks, and there was only 5 percent of males did light jobs, including using hand tools to break down rocks into small pieces.



Figure 3.10 A horizontal rat hole where individual miners can dig materials

Rat holes can be found in the hills and randomly scattered around mining settlements. They vary in size (depth and width), ranging from 10 to 50 metres. To help miners get oxygen in the underground areas, miners fixed an air blower connected to plastic tubes approximately 100 metres long. Miners labeled this thin transparent plastic as sugar plastic (*plastik gula*) because stall vendors mostly use this plastic for packaging sugar in small packages. For the deep vertical rat holes, rat diggers work in a group of four or more people. I observed one to

three miners go down a rat hole to dig and collect material from the vertical and horizontal tunnels. One of them would place the excavated materials in a sack and attach it to a rope, and another person on the surface would lift the materials using a rope and a bamboo winch. The workers who collected the material down in the shaft would give a noisy signal by pulling on a plastic rope connected to drink cans to let people on the surface know that the sacks were ready to be lifted.

Miners share unwritten rules to make sure that a hole does not collapse. For instance, people digging holes should dig 5 metres away from another hole; and other people should not dig on the top edge of the hole. Some groups of hole diggers would cover the hole with a wooden cover and lock it when they went on a holiday if they thought their holes could still yield some gold materials. The hole digger would work individually if they dug horizontal holes in the large excavator holes.



Figure 3.11 Rat holes in the blue tent (*tenda biru*) mining settlements of Padambila

Payments for all these mining activities depend on the agreements between the boss and their workers. For panning activities, individuals are free to control their money. Most miners made payment agreements with miners who work for a group, for instance, the *dompeng* group based on the percentage of the results. The boss would take 40 percent of the results, including the initial capital outlay, while the workers would get 10 percent each.



Figure 3.12 A vertical rat hole with winches, blower, ropes and cans used to signal that the materials or people are ready to be lifted up

Panning: A cooking pan and a drop of mercury

The favourite mining technique for individual miners in Bombana was panning along the rivers and in the *dompeng* holes because of its tiny capital expenditure. Panning requires low initial capital: for example, tools such as a pan, shovel, container, mercury (optional), and bags. The price of a pan depends on the pan's diameter: the bigger the diameter, the higher the price. The prices range from 50 thousand rupiahs (approximately AUD 5) to 10 thousand rupiahs (approximately AUD 10). For panning, miners also require additional equipment such as shovels to dig rocks and sand; a plastic sack to contain materials. They also bring a small container to store any gold they find at the river.



Figure 3.13 Panning activities along the Kasutahi River, the area where gold was first found. (Kendari Pos, 2008)



Figure 3.14 Panning activities in a *dompeng* hole after the washing carpet process

Some people brought small amounts, (one or two drops, approximately 0.05 milligrams) of mercury and placed them into the container where they put materials (sands or soil) containing gold flux. Other people put the mercury in a separate container. Some people reported that the first mining method conducted in the gold rush era was panning along the river. Nowadays, most people pan in the *dompeng* holes or the tailings of *tromol* machines. More women than men prefer to carry out panning activities.

Social Diseases/Issues (*Penyakit Masyarakat*)

Concerns about the mining economy expressed by the Bombana community were predominantly about social issues undermining their health—socially, physically, and mentally—since the gold rush began in 2008. Police officer, Dedi, informed me that there were many criminal issues related to risky behaviour during the gold rush period in the mining sites. These criminal activities had extended into the community settlements in the capital city of Bombana. Police officers labeled these social problems as social problems or social issues (*penyakit masyarakat*), including alcohol consumption, gambling, cockfighting, drug abuse, and prostitution. The following section will discuss how social issues regarding physical risk, mental health, and smoking have arisen and affected the miners' lives.

Liquor and Gambling: Making Friends and Enemies

Bombana society considers alcohol consumption and gambling to be social issues. Most miners participated in cockfights, domino cards and billiard games, which provide entertainment in remote mining areas. In addition, many miners were also involved in gambling, which has become a secondary source of income that can amount to hundreds, thousands, or up to millions of rupiahs. Most male miners told me that while participating in gambling games in a group gathering, they also consumed traditional alcohol called *tuak* or *arak*.

Some people in Rau-rau village produce their own alcohol and distribute it to miners and villagers. Local people have long produced and drank alcohol as entertainment (*hiburan*) during gatherings. On 5 November 2014, Sudirman informed me that the most common alcoholic beverages consumed by miners are traditional forms of alcohol called *tuak* or *arak*

and a commercial product *anggur kolesom* (dark wine with the brand name (*Cap*) '*Orang Tua*'). *Arak* or *tuak* is traditional alcohol made from a palm tree. The palm tree sap is collected from the stalk (*mayang*) where the fruit stem joins the trunk and is then mixed with mangrove bark and traditional spices. It takes several days for the palm mixture to ferment to produce alcoholic *arak* or *tuak*. He secretly sold the alcohol for 200 thousand rupiahs approximately AUD 20, for one 5-litre container. He sometimes also hosted his friends in his house where people could drink and chat. Most people who drink are males and they drink during the day, afternoon or evening time after doing activities such as farming. He told me that the drinking activities were more frequent since gold rush because people did a lot of physical activities and have more money. Miners needed alcohol to help them relax and they also have more money to buy alcohol.



Figure 3.15 A commercial producer of black wine (*anggur hitam*) with the brand name *Anggur Kolesom Orang Tua* and it is also called as with its brand name *Anggur Kolesom*

Social, gender and morality issues in the Bombana community are closely related to the phenomena of alcohol consumption and gambling. Drinking and gambling behaviour seem to be mainly triggered by social pressures and are especially peer-influenced. Most male miners indicated that they drink palm wine (*tuak*) to make friends and entertain themselves, seeking pleasure because of the lack of entertainment facilities in the villages, particularly in mining sites. Some miners claimed that they could mine all day long under the influence of *arak*

without feeling tired and that they felt relaxed and could go to sleep faster when they finished work. They also claimed that *tuak/arak*, suits their health and personality, making them strong, brave, and lively.



Figure 3.16 Gambling at a cockfight



Figure 3.17 The head of the Bombana police office leads the destruction of liquor (*minuman keras*) supplies

Gender issues lay behind these behaviours. If we compare males and females, more males were involved in gambling and drinking activities than females. If we compared women and men, Bombana culture tolerates men who drink alcohol as normal, but women drinking is stigmatized, regarded as immoral. Men stated that they felt more masculine when drinking and gambling.

The Bombana community are predominantly Muslim make negative judgment judgments of miners who drink and gamble. Muslim miners stated that Allah prohibited them from consuming alcohol, gambling, and taking drugs according to the Quran, hadith, and Islamic law (Al-Qaradawi, 1999; Michalak and Trocki, 2006, p. 523) (see chapter two). Some people who were Christians, Hindus and Buddhists, religions that tolerated drinking alcohol stated that they viewed drinking as part of normal lifestyle.

However, none of these people approved of drunken behaviour following excessive drinking, behaviors that can lead to fighting, injuries and even death. Some villagers informed me that a man had his right hand cut off because his drunken friend slashed the hand with a sharp cleaver. Another case was of a local youngster under the influence of alcohol who killed a migrant miner during a volleyball competition in the village because he felt offended by the victim.

Narkoba: Drug Abuse and Digging All Night long

Drug abuse refers to the misuse (*penyalahgunaan*) of narcotics (*narkotika*) and illegal drugs (*obat terlarang*). This term is well-known as *penyalahgunaan narkotika dan obat terlarang/Narkoba*. The Bombana society considered *Narkoba* as another form of community issues, and it is a silent problem prominent among Bombana miners. The local newspaper (Hasman, 2015a; Hasman, 2015b) have reported the case of narcotics, known as *shabu/shabu-shabu*, in Bombana mining sites. Hasman (2015a) reported that AM, a drug user, was arrested at the Watubangga mining site when he set up drug equipment—called a *bong*—for *shabu/shabu-shabu*. The police laboratory tested his urine in their laboratory and found it contained amphetamine. Amphetamine is a medicine that has a stimulant effect on the human central nervous system and can be physically and psychologically addictive when overused. According to Kramer, Fischman, and Littlefield (1967, p. 305), the abuse of amphetamines has adverse effects such as sleep deprivation for up to five days and rendering users paranoid, disorganised, and lethargic. Hasman (2015b) also reported a case of a drug dealer in the

Bombana mining area and the increasing prevalence of *narkoba* in Bombana, as noted by the police.

At the Padambila mining site, William showed me a 50-metre rat hole where some miners had stashed their drugs while mining. He claimed that drugs could generate euphoric feelings and keep miners active. The two miners who consumed the drugs managed to mine all day long, working for 24 hours without a break. William suspected that the drugs were *shabu-shabu*). The local police obtained information from other miners and arrested them. William said they could no longer use the shaft because the *jinn* had hidden all the gold from that shaft, as a punishment for the miners involved in drug abuse; they stigmatised it as *haram* (or taboo) behaviour.

Reflecting the moral sensibility discussed in the previous chapter (see Chapter Two, about *rezeki* and *bala*), William indicated with his fingers. He said: “If you are doing good things, like this [he pointed his index finger straight up], you can get the gold. But, if you behave like this [he crooked his index finger], you will get punishment from God. *Jinn* will hide all the gold from you even if you are mining until you drop. You will not find any gold anymore”.

The prevalence of drug abuse in the Bombana mining area can be viewed as an iceberg phenomenon. Small numbers of people engaged in drugs are spotlighted through the media; however, the number of drug users is much more significant. Some miners and police officers I interviewed admitted that many miners were drug users. Illegal drugs such as marijuana (*ganja*), amphetamines (*shabu-shabu*), and morphine were prevalent in the Bombana mining sites because there was a lack of control by the police, with most police officers only targeting the distributor or the drug vendors and not pursuing the drug users.



Figure 3.18 A chart posted by Bombana local police officers under the *Narkoba* section that controls drug abuse issues in the Bombana area

I visited the Bombana Police Office and interviewed Mukid, the head of the drug section in the police district, on 22 December 2014. Mukid confirmed that the police could not target all users due to a lack of financial support from the local government. He said that 'the local police department only allocates 20 million rupiahs (approximately AUD 2,000) per year to target drugs users. The money might be able to cover one or two cases but not all cases in Bombana'. He also argued that if the police arrest one drug user or vendor, it can cost them around 5 to 10 million rupiahs for that one case. The local police have to send the suspect to the court office in the Buton district, a whole day's transportation by boat. The police feel it is challenging for them to spend time and money on drug cases.

Local Single Man (*Bujang Local*): Prostitution, Sexually Transmitted Diseases/STD, HIV-AIDS, and Taboos

Prostitution is also considered a social issue in the Bombana mining area. I observed that the patron-client system of prostitution common at Bombana mining sites is driven by the temporary condition of male miners who are away from their spouses. One miner jokingly introduced himself to me as 'local bachelor' (*bujang local*), because he had left his wife behind in his hometown. He argued that it was customary to seek out 'candies' (*'gula-gula'*), meaning

women, while he was temporarily single (*bujang*). He came alone because he could not afford to pay for his family's upkeep at the mining sites. Indeed, his wife had refused to follow him to the mining sites because she had heard about the poor living conditions in the mining settlements.

Male miners are potential users of prostitutes' services, and female prostitutes are the service providers. I had a conversation with Rosnia—the wife of Pak Desa—during my visit to her house on 20 December 2014 regarding the issues of prostitution. I told her I had met a beautiful woman at a Padambila mining site who helped the Javanese woman cook in a coffee tent. With a soft voice, she enthusiastically told me that female prostitutes usually come from outside the mining areas and always from outside Rau-rau village. According to the gossip among the women (*ibu-ibu*) in the village, two Moronene women from a neighboring village worked as cooks in mining sites to conceal their profession as prostitutes. Prostitutes did not want to be identified because of cultural taboos and moral issues in Bombana society. Moreover, I did not hear about male prostitutes during my conversations with the villagers.

According to the villagers and miners, prostitution practices were prominent and secretly conducted during the gold rush in 2008. Still, the practice continued strictly hidden until after 2010 when the police began targeting sex workers as a social problem, an operation locally called *Operasi penyakit masyarakat (Pekat)*. Sex workers hid prostitution practices because the police conducted frequent raids called Pekat. For the local female prostitutes, they hid their sex business because of police raid and also social sanctions from the society such as be called bitch (*perempuan murahan*) and this sanction will subsequently affect their big family name, respect and status in the Bombana society. Female prostitutes from outside Bombana came to the Rau-rau mining sites because they believed they could earn easy money. They operated their sex business in blue tents where they provided sex services to their male clients. Some female sex workers came over to the male clients' blue tents to offer their services. The payments for sex transactions were mainly in gold rather than cash. Because there was limited cash in the remote mining sites, female prostitutes who were considered beautiful received between one to two grams of gold as payment. Prostitutes considered only reasonably attractive received less payment, only one or two kaca (*satu kaca dua kaca*). One kaca is 1/10 gram or 0.1 gram of gold which was equal to two hundred rupiah or approximately 20 AUD.



Figure 3.19 The blue tent where some female prostitutes live and work

I believe that prostitution in Bombana mining sites and the migrant labour system⁹ may have contributed to the increasing number of Sexually Transmitted Diseases/STDs (*Penyakit Menular Seksual/PMS*) and HIV/AIDS cases in the area. However, the cases of STD and HIV/AIDS in Bombana mining sites are under-reported for several reasons: the lack of professional capacity to detect and follow up on cases and identification of symptoms; the lack of awareness of the need for self-examination by the suspected patients; the lack of the use of condoms, and limited budget and attention from the government.

Tarsan, the local health department officer, conceded that there were no accurate figures on the number of STDs or HIV/AIDS cases recorded by the local community health service (*puskesmas*) or *Dinkes Bombana*. In addition, Doctor Indah, head of *puskesmas* in North Poleang—located on the border of Rau-rau village—explained that most health professionals are not able to check the symptoms of sexually transmitted diseases, causing under-reporting of health problems. In addition, health professionals face difficulties following up the migrant miners who were diagnosed with STDs due to their high mobility. Most migrant miners or their relatives came and went to the mining sites quickly. Sometimes, they only visited the

⁹ Jochelson, Mothibeli, and Leger (1991, p. 157) argued that prostitutes and the migrant labour system in South African mining sites were responsible for the increasing number of cases of STD and HI/AIDS in that region.

community health service if severe conditions required medicine, particularly antibiotics. In addition, although the community health service officers always referred someone suspected of having an STD to the Bombana Hospital to receive a blood test for HIV/AIDS, patients did not always follow up on their referrals. Moreover, some patients could not afford to pay the laboratory test fees and preferred to visit traditional healers. Most Bombana people, both migrants and locals, trust the traditional healers over health professionals (see Chapter Four, about risks of mercury).

In an interview on 16 December 2015 with officers of a local Non-Government Organisation (NGO) called Lembaga HIV/AIDS/LAHA¹⁰ concerned with HIV/AIDS, I learned about a case of HIV/AIDS in Bombana. Abu revealed that his organisation identified a case of HIV/AIDS at the PT. Panca Logam Makmur (PT. PLM) mining company. LAHA officers were working with the South East Sulawesi Provincial Health Department (*Dinas Kesehatan Propinsi Sulawesi Tenggara*) officers to conduct blood tests for HIV—called a *sero survey*—of all employees of the mining company. They found that a male miner tested positive for HIV. When management of the mining company discovered one of their male employees was HIV positive, they silently fired the worker. Other workers did not know about this case because management covered it up. The LAHA officers argued that this HIV/AIDS case should keep anonymous to respect the worker's human rights living with the disease.

I have mentioned in previous paragraph that the local prostitutes in Rau-rau mining sites were more worry about social sanctions and police raid while migrant prostitutes worried about police raid more. The migrant prostitutes did not feel strong of social control to their behaviors. This is the evidence that the Bombana community has maintained social control of sexual intercourse and sexual relations outside marriage by resorting to the sanctions applied in moral transgression, sin, and taboo. William told me stories about how he controlled the morality of miners working in his Padambila mining settlement. First, they are not allowed to beat their wives or husbands. Furthermore, husbands and wives are not allowed to cheat on their partners. William and most miners believe the *jinn* who look after gold will hide the gold from them if they do. On behalf of the mining owner, William has the right to stop someone from mining if they take any unmarried females or males sleeping in their tents with them on the mining site. He told the story of a daring couple, a married female and a married male, who had sexual intercourse in a rat hole. They were cheating on their partners, who were also

¹⁰ LAHA is the local non-government organisation (NGO) concerned with treating HIV/AIDS in Southeast Sulawesi.

miners. When they could not find any other place to have sex, they decided to have intercourse in the rat hole. They were found dead in the shaft and could not be pried apart because their genitals were stuck together. Their dead bodies were buried together in one hole. William and most miners believed that the *jinn* punished such transgression as cheating on their partners as sinners. Some people also suspected that their punishment resulted from black magic by the living wife and living husband.

Learn to be Patient (*Belajar Sabar*): Stress (*Stres*), Loneliness (*Kesepian*) and Mental Health Issues

At the Bombana mining site, miners have experienced mental health issues in mining sites. However, the Bombana community has not yet fully recognised stress and fear of crime, isolated living conditions, the sweeping (*penyisiran*) actions by police, horizontal conflicts, crowding in the camps, or violence as part of their perception of mental health issues. They also did not have a concept of mental health but did talk about '*stres*'. Miners stated that they were very '*stres*' (stress) living in the mining camps. Jerrell (1998) highlighted that culture and ethnicity play significant roles in defining mental illness. Kleinman (1987) advised to consider a cultural analysis of psychological disorders. We need to consider cultural context of such an illness, mental health or psychological disorder viewed by the local Bombana people or miners.

Some miners reported feeling stressed and lonely during my mining areas visits. They admitted that the harsh living conditions in the Bombana mining site were a leading factor contributing to their unfavourable psychological states. The nature of the heavy mining work, the isolation and the heat caused miners to become easily angry and stressed. Loneliness, isolation from their family and the lack of entertainment facilities added to their mental stress.

Miners were also concerned about violence, thefts, homicide, and horizontal conflicts. One woman of Chinese descent, a gold buyer, was robbed, stabbed, and killed on her way back to Kendari on a quiet road along the National Park Rawaaopa Watumohai. I also experienced fear firsthand when thieves targeted my rented house during the first month I conducted research in Bombana. The villagers also gossiped about robbers who stole a locked motorcycle from the locked house of a police officer.

Miners also possess their way of coping with stressful conditions. A male miner told me that if he misses his family left behind in his Kendari home and became bored or stressed, he called his wife, children, parents, and friends. When he can no longer cope, he would suddenly decide to return home. Some people managed to go back to their family once or twice a month.

Miners also managed their day and the duration of their work in mining sites in such a way to recharge their souls or psychological states. Most miners decided that working four days a week and having a rest every Friday was good for them. In an informal conversation with Sulaiman on 24 October 2014, he reasoned that Friday is an excellent day to rest because most male miners do not need to come back home just for bathing to go for *sholat Jumat* (Friday prayers). This prayer is compulsory for Muslim men expected to attend the prayers and accompanying sermons. Some Muslims also believe that *sholat jumat* is an important, sacred day, so they should prepare themselves by bathing, shaving, and applying pleasant-smelling perfumes to seek God's blessing. Most Muslim miners believe that allocating their time for Friday prayers can increase their closeness to Allah SWT, the only God that can grant them more gold *rezeki* (see Chapter One).

Meanwhile, others argued that taking a rest on Fridays recharges their bodies and souls. However, miners who do not need to observe Friday prayer continue to mine, and they believe that all days are the same and they can rest any time they want to.

Although mining seems synonymous with stressful and negative psychological issues, some miners see it from a different perspective. They found that mining sites are delightful places because they can meet many people, make new friends, and earn money to help their families. One of these was Pak William, who told me during our conversation on 28 February 2015 in Padambila that 'The mining site was where I learned to be passionate and patient'. He admitted that mining taught him to develop self-control over his temper. He needs to manage people from different cultural backgrounds and thus be more patient and respectful.

Riots (*Tawuran*): Horizontal Conflicts and Security

Horizontal conflicts were also of concern and occurred between individuals and across ethnic boundaries. Several individual fights occurred for personal reasons that led to injuries and death. One famous horizontal conflict occurred between the local indigenous Moronene people and migrant miners from Palopo, Southeast Sulawesi, leading to riots and broader ethnic conflicts. The local online newspaper *Kendari Pos* highlighted the story of a male migrant miner who had beaten the customary ruler or *Mokole (M)* of Rumbia. A male migrant punched the Mokole because he was upset he did not get any mining concession land in Polodu hamlet (Pati, 2013). This case triggered anger and strengthened the solidarity of the Moronene people.

Some local people visited mining sites they suspected belonged to the Palopo ethnic group and started fights with them. The police and military had to intervene in this situation. The conflict between these ethnic groups was no longer occurring during my fieldwork, but tensions between migrants and local miners simmered beneath the surface and could explode at any time. There were several occasions when people died in mining areas. Horizontal conflicts between the Mokole's followers and migrant miners from Palopo frequently occurred. There were also protests and demonstrations against mining companies in the mining sites.

Miners and mining companies had strategies to manage their security and respond to threats and issues resulting from horizontal conflicts and the rising criminal problems. Individually, most male miners who lived in remote mining sites walked around with weapons such as *parang* (machete). Private mining landowners and mining companies also implemented security precautions at their mining sites.



Figure 3.20 Two army officers, Pak Saleh, and his friend (in black), who are responsible for Security in the Rau-rau area

The owners of the local mining land and mining companies, such as PT. Tiran hired police officers from the *Brigade Mobile (Brimob)*, or personnel of the Armed Forces of the Indonesian Republic (*Angkatan Bersenjata Republic Indonesia/ABRI*). Some private mining landowners also hired former prisoners or prison personnel considered brave. Some mining companies applied strict procedures for security and safety reasons—for instance, PT. Panca

Logam Makmur, located in Wumbubangka village, did not allow illegal miners into their mining areas to prevent them from stealing gold and equipment such as *dompeng* machines. Also, they did not want to be responsible for illegal people having accidents in their mining concession areas, leading to hefty bills for compensation.

Physical Dramatic Events: Tunnel Collapse and Greed

Tunnel collapse, locally called 'collapsed land' (*tanah runtuh*), is a dramatic event that raises physical and social concerns for the Bombana community. People encounter the most common physically dangerous events for many miners in mining sites are ground or tunnel collapses. These collapses are unforeseen, sudden events leaving miners injured, buried, or dead. Miners who dig in rat holes are at the highest risk. Miners who operate panning and *dompeng* activities also frequently experience falls resulting from ground collapse when climbing on the slippery edges of holes.

Most miners see tunnel collapses as tragedies framed in moral terms. Ellen and Soemarwoto (2010) found that this was also the case for the Rejang people, accusing the victims of greed and having bad luck. They conceive the risks of tunnel collapse according to the severity of the injuries, their chance of incurring injuries, and the cost of recovering from those injuries. Some people associated tunnel collapse with greedy and ungrateful behaviour (*tidak bersyukur*). During an informal group discussion with Rau-rau women miners on 28 January 2015, Hasnia, a miner of Moronene descent, told me that two friends had passed away in a tunnel collapse tragedy because they had been too greedy for gold. She had reminded them of the signs of the tunnel collapse, such as soil falls. However, they had ignored her because the more they dug the tunnel, the more gold they saw in front of them. She believed that her friends were controlled by *jinn* (see chapter two), which had shown them the gold. When they could not control themselves and ignored people who warned them about the potential collapse of the tunnel, they were unable to escape, and their bodies were buried. Other miners could not remove the bodies manually. Later, their dead bodies were extracted using an excavator. The national media, *Kompas.com* (2008b) and M3sultra. (2009) have reported that 39 miners died in Bombana mining accidents because of collapses.

Miners have their own practical and *cultural* methods for reducing the number of fatal tunnel collapse in rat holes. They have an unwritten agreement that the first time they dig the hole, every one of the three or five group members has to make sure not to dig around the

mouth of the hole. Bamboo poles are placed to support the soil and to guard against collapse. A male hole digger reported that 'We can see the condition of the land, [and] if it seems [likely to] collapse, then we need to run to a safe place'. Other ways to reduce the risk of physical injury are performing certain rituals and calculations (see chapter two about *rezeki* and rituals).

Besides dramatic events such as tunnel collapse that cause injury and death, most miners pay little attention to injuries or illnesses stemming from their everyday activities, such as continuously lifting, pulling, and carrying heavy loads. They admitted that unsafe posture and soaking their bodies in the muddy water for too long did not concern them much as the risk of tunnel collapse. Most miners complained of headaches (*sakit kepala*), arthritis or pains in their bones (*sakit-sakit tulang*), itchiness, and rashes. However, those conditions did not worry them. They sought treatment only when they were suffering from diseases that affected their bodies in ways that impeded them from performing their usual tasks, such as mining, cooking and washing. Building understanding that illness is a severe condition that prevents them from performing the usual tasks specifically related to mining. This is the evidence that Bombana miners have constructed an emic approach (Jorion, 1983) that the local people used their own local culture, language, knowledge, perception and experience to define the meaning of illnesses, sickness and diseases related to mining.

Cigarettes and *Pokompohulu (M)*: Blowing the Smoke of Risk, Masculinity, and Respect

Based on the view of officials in Public Health Department (Dinkes) in Bombana, smoking tobacco is common among men and has become a prominent social issue in the Bombana village and mining community. Tarsan informed me that the officials from Dinkes have recognised the issue of smoking in the society and they had prioritised this issues to address in their health promotion budget (see chapter seven). However, Bombana local culture recognized the smoking behavior as culturally accepted behaviors.

The first time I met most of the community leaders in the reception meeting in the Rau-rau village, almost all the men in the meeting room were smoking. Only one five-year boy, Arul, did not smoke. Most of those men did not hesitate to blow the smoke around infants, children, and women who did not smoke. I saw males dominated smoking behaviours. According to my survey of 200 miners, 95 percent of smokers were men, with only 5 percent

female smokers. In addition, approximately 98 percent of male miners smoke while digging in the open-air hole areas. There was also a high incidence of children smoking (see chapter six, about children in mining).

Some female miners also smoke when they are working. I spoke with Ani, a 60-year-old woman in the Padambila mining settlement, sitting on the ground blowing smoke from her cigarette. Her reason for smoking was: 'Instead of me just [being] exposed to smokes of cigarettes, I [would] rather smoke with the men'. Women smokers are usually older women or married women because Bombana society accepts older women smoking as usual. Ani informed me that young women—particularly those of school age—and unmarried young women who smoke are labeled as evil women and associated with whores or prostitutes.

While the Bombana public health officers campaigned for the 'World No Tobacco' Day on the 15 October 2015, the smoking phenomenon remains pervasive among Bombana people, particularly in the gold mining society.

Smoking behaviour is standard among the Moronene people and most Bombana people because smoking was part of traditional cultural gifting and exchange, according to *Moronene's* customary practice (*adat*) called *pokompolulu* (M). The traditional invitation is based on direct interactions with the person through smoking together. People use cigarettes, handkerchiefs, and white plates when extending an invitation to an event instead of using an invitation card (*kartu undangan*). People who are invited in *Pokompolulu* style are recognised as being highly honoured or respected in the Bombana community, and their attendance is expected. Respected people are mostly males, community leaders (*orang tua kampung*), traditional healers such as *Tolea* (M), and *Kamutaa* (M), People who are invited with. The host of a party such as *syukuran* (see chapter two) will send a courier with a cigarette on a little white plate, wrapped in a white handkerchief, to respected invitees. This ritual is mainly conducted in the early morning or the afternoon before and after the Maghreb prayer time (around 6-7 pm). When the courier arrives at their destination, the respected person should receive the tobacco using both hands and grant the courier the opportunity to deliver the host's message verbally. The receiver should express their gratitude to the messenger and indicate whether they will attend the party or the *adat* ceremony.

Figure 3.21 Smoking is common not only among women and male miners but also among child miners



The ritual of offering tobacco or *Pokompolulu* was also conducted along with *adat* ceremonies, such as weddings, circumcisions, and shaving hair. The ceremony hosts will offer cigarettes on plates to all guests in the room to express their honour and gratitude for their attendance. The *pokompolulu* also reflects gender segregation through smoking behaviour, and more men were offered cigarettes than women during the *adat* ceremonies.

Cultural smoking behaviour has promoted and justified smoking in the modern context for the Bombana community. Men are more likely to smoke to express their masculinity in public. Both men and women acknowledged that they smoked because they felt more macho (*lebih jantan*), confident, and masculine when holding a cigarette. Ng, Weinehall and Öhman (2007) found a similar view among Javanese male teenagers struggling to become men.

Conclusion

This chapter has discussed how miners in Bombana mining sites have struggled (*berjuang hidup*) to sustain their livelihoods and the harsh realities of their working life.

Miners and villagers have integrated the political construction of identity (Cohen, 1993; 1994; Erikson, 1959; 1980; Sökefeld, 1999; 2001) into their daily social interactions, mining activities, and dwelling preferences. The construction of this identity based on their ethnic groups and ethnicity (Cohen, 1993 and Erikson, 1959) such as Moronene, Bugis, Tolaki, etc. The divisions of 'selfsameness' (Erikson, 1959, p. 102) are acknowledged as local and migrant. However, the communities have also constructed shared identities (Sokefeld, 1999, p. 147) or self-consciousness identities (Cohen, 1994, p. 11) according to their official residence status, engagements in mining, residential preferences, village regulations, the administrative area they live, the language they speak, and the place they originally come from. They also enacted political identity to gain autonomy (Williams, 2008). Since official residents gain more autonomy than migrants, migrants seek such acknowledgment so that they too can receive autonomy.

In the mining sites, solidarity (Durkheim, 1960, p. 71) emerges in sociality between miners who share a common fate. This solidarity is based on their struggles in mining areas, such as dealing with challenging physical work, a harsh environment, and precarious existence. The system has provided local and migrant miners opportunities to be equally involved in mining-related activities. Both parties have equal opportunities to choose the modes of their engagement in mining. For instance, people who came to Padambila mining sites through the network (*kenalan*) draw on their social capital (Bourdieu, 1986) to be accepted and counted as part of the mining site. The mining community has a familial model of social relations. For instance, William stated that he felt part of a family in the blue tent village (see page 34). This is an informal structure, a locus of mechanical solidarity (Vaught and Smith, 1980, p. 159). It is a form of social capital that enables migrants and local miners to maintain harmonious relations and sustain their livelihoods in the mining activities.

Miners with economic capital possess the flexibility to choose the mining mode they want to engage in. They mostly choose mining methods involving less physical activity, for instance, being the boss of *dompeng* or *tromol* groups. As the boss, they will employ their economic, cultural, and social capital to hire staff and manage relations with the mining company and gold buyers. However, most miners with limited economic capital choose mining activities that involve reasonable initial capital, such as panning, *padompeng* (employees of

dompeng/tromol and jet sluicing activities), and being *rat-hole* diggers. To overcome a lack of economic capital, miners will negotiate their cultural and social capital to gain access to many mining activities; for instance, they will contact their acquaintances, relatives, or friends.

Gender has also influenced the division of labour in mining sites. I found that men dominated most heavy mining modes, such as *dompeng*, *jet*, *kato*, *tromol* machine, and *rat-hole* digging. They also monopolised jobs with high returns. More men dug vertical rat holes while female miners preferred to dig horizontal rat holes. Whilst men were likely to occupy mining activities with high initial capital, women chose mining activities with less economic capital and minimum physical risks, such as panning and crushing rocks into fine material (locally known as *marempel* (*M*)). Women mostly stayed in the blue tent settlement doing their mining activities rather than residing in local mining houses.

Although the blue tarpaulin mining settlements are considered a difficult environment to live in, most miners admitted they did not care about the depressed habitat; instead, they were more concerned about the gold they could find. Most miners acknowledged that they had experienced the very harshest conditions of life, and these experiences taught them that they have to be content with their life now. They should be grateful (*bersyukur*) because they have the chance to generate money to get *rezeki* from gold mining (see chapter two). Thus, the miners did not see the blue tents mining environment with its poor conditions as a threat to their livelihoods. They are also ignorant of poor hygiene and sanitation risks and want to survive in the mining environment. Their cultural understanding allows them to address risks and cope with the hazards of the poor dwellings and infrastructure, such as the inaccessibility of clean drinking water. However, their fears of not surviving underpinned their worries about the risks of the environment and the embedded social problems.

Social problems in Bombana mining sites were locally known as social issues (*penyakit masyarakat*), including drug abuse (*penyalahgunaan Narkoba*), alcohol abuse (*drinking arak* and *tuak*), gambling (*judi*), and sex workers (*prostitusi/pelacuran*). These were seen through the lens of the community's morality according to cultural and religious values and norms. However, some social issues have not been categorised as *penyakit masyarakat*, such as the psychological/mental health issues related to fear and anxiety, STD and HIV/AIDS, and smoking behaviours. Still, they also had practical strategies to cope.

Miners also minimized the risks of tunnel collapse because their perceptions of those risks were determined mainly by their social and cultural beliefs. Those risks were connected to cultural morality and religious values in the form of transgressions, sins, and violating taboos.

Generally, the Bombana society has developed coping strategies to navigate social issues related to the comprehensive health risks (physical, social, and psychological) prevalent in the mining setting. Another social problem that has not been recognised in the Bombana community is related to the use of mercury, which I will explain further in the next chapter.

Chapter Four

The Silent Risks: Mercury Amalgamation and Ignorance

On 21st June 2015, I met Bakri, the leader of a *dompeng* machine group working in the PT. Dinasti mining concession. I asked him, 'Do you use any mercury?' He replied, 'No, we don't use mercury but *air raksa*'. As my eyes followed his right hand, he picked up a 200 ml glass drink bottle with the label M-150. He handed the bottle to me and told me that he had put the *air raksa* in it. When I checked the contents, I was sure it contained mercury, based on its sparkly appearance and lack of smell. While Bakri claimed that he did not know about *merkuri* (mercury), the chemical substance he used had the same physical characteristics as mercury. Pak Bakri was one of many people who did not know the term mercury (*merkuri*), the properties of that chemical and the risks it poses.

Bakri and other miners have extensively used mercury for gold amalgamation in the Bombana mining areas. My observations indicated that most miners used mercury in *mendulang* (pan) and *mesin tromol* (trommels machine/screen or rotary screen) for gold processing (see detailed information on panning and trommel machine below in this chapter). Mercury is also known as quicksilver and has the chemical name of Hydrargyrum (Hg) and the atomic number 80 (Mukherjee, Zevenhoven, Brodersen, Hylander and Bhattacharya, 2004). This chemical has been seen as a valuable substance for humans, despite its adverse effects on their bodies and the environment (Lind, 2007). Industries use this substance widely to produce chlorine, thermometers, fluorescent lamps, and dental amalgam and it is used widely in the amalgamation process in mining activities (Mukherjee et al., 2004; Lind, 2007). Amalgamation is a process of binding gold with mercury alloy to form an amalgam (Hinton, 2005, p. 5).

While researchers have shown that mercury has contaminated Bombana mining areas,¹¹ and the local and national mass media have loudly reiterated the risks associated with mercury contamination in the Bombana mining sites,¹² the issue of the risks of mercury is not raised by miners and residents in Bombana, especially when compared to issues such as the

¹¹ Trisnawaty, Emiyarti and Afu, 2013; Sara Beavis and Andrew McWilliam (2015); Basri, Sakakibara and Sera (2017); (Basri, Sakakibara, Sera and Kurniawan, 2017); Pidani and Mokui (2017).

¹² Aminah (2014); Ashari (2014); Dar (2015); Fajar (2015); M3Sultra (2009); Putera (2015); Usman (2014); Zona Sultra (2015)

accidents associated with mining activities—for example, tunnel collapse—and symptoms of social problems in the community (*penyakit masyarakat*) (see chapter three). The silent risks of using mercury in this mining area reflect the ignorance of the miners and administrators (High, Kelly and Mair, 2012), an ignorance shared by most Bombana people.

This chapter will employ the anthropology of ignorance (Hope, 2005) to identify what factors contribute to the phenomenon of the silent risk of mercury use in Bombana mining. According to an anthropologist, Hope (2005, p. 76), ignorance means 'not knowing and not paying attention' and 'a state that people attribute to the other'. Several development studies scholars (High, Kelly and Mair, 2012; Hope, 2005) argue that ignorance indicates the antithesis of knowledge and can be judged according to morality. In identifying 'the silent risk' of mercury, I compared the understanding (or lack thereof) in informant expressions of their understanding of mercury, the lack of scientific knowledge by health and government personnel with what science reveals about the risk of mercury.

Firstly in this chapter, I explore the use of mercury for amalgamation processes, describing handling methods and their efficiency. Following this, I explain local perceptions and terminologies for mercury. I portray how both insiders and outsiders of the Bombana community perceive the risks of mercury according to their existing knowledge and political and socio-cultural backgrounds. Additionally, I will explain the knowledge discrepancy between miners and health professionals. Furthermore, I illuminate the uncertainty surrounding mercury regulations in the community, along with the issues of local politics and religious morality. Finally, I discuss the illegal and secret called black/dark market (*pasar gelap*) supply chain of mercury.

Mercury Amalgamation: Handling Methods and Efficiency

Miners in the Bombana gold mining area use mercury compounds in the amalgamation process with mining techniques such as *tromol* and panning. Some miners acknowledged that they also use cyanide. However, according to Sulaiman in my interview on 25th October 2014, mercury is a faster and more practical substance for amalgamation than other chemicals such as cyanide for extracting gold.

Mercury is used in more than fifty developing countries worldwide for gold amalgamation. It effectively binds gold particles together and separates gold from other substances, such as sand and soil (Veiga, Maxson and Hylander, 2006, p.436). This method is

familiar to the Bombana miners. As stated in chapter three, miners in Bombana employ several techniques for extracting gold; the most well-known one is mercury amalgamation.

A Bottle of Mercury for *Tromol* Machine (*Mesin Tromol*) and *Matoyong(B)* Processings

I conducted observational research on how *tromol* machines (*mesin tromol*) work in the Padambila mining settlement, where a set of *mesin tromol* belonging to William is located. The machine set had eight centrifuges (*drum/drom*) connected with rubber belts to the rotor machine (*mesin pemutar*) which spun them. Those drums have functioned as screens for the amalgamation process. Some heavy iron rods, called 'bullets' (*peluru*), were placed into every centrifuge to grind small rocks and solid materials into a fine material when the centrifuges were spinning. There was at least one *tromol* operator (primarily male) responsible for managing the *tromol* machine processing, including helping owners of materials place their sacks of rocks and soils into those heavy metal centrifuges and operating the engine. The operator was familiar with switching the machine on and off, tidying the belts connecting the centrifuges, and causing them to spin. To regulate how long miners worked on *tromol* processing, the male operator placed a timer—along with instructions for operating times—up on the wall where the burning amalgam was located. He stopped the machine and opened the thick, heavy metal lids of the mills after approximately thirty minutes of spinning.



Figure 4.1 A set of *tromol* machine with ground tailings. Miners use tarpaulins to collect and recycle water from the machine. They can also carry out further panning on the tailings

The technology used in the *tromol* machine requires mercury at the end of its processing stage to bind the gold and separate it from the delicate materials. The male operator poured approximately 100 grams of mercury—or half of an energy drink bottle named Kratingdaeng or M150— into each centrifuge. To ensure the mercury was mixed thoroughly with the gold, he continued to run the mills for approximately another thirty minutes. When this time had elapsed, the machine was stopped, and the operator gently rolled those centrifuges, one by one, to release the water and sand into a bucket, leaving the mixed gold and mercury at the base of the centrifuges. The water in the bucket was placed into the plastic tailing near the *tromol* machine. Then the operator called the female owner who owned those materials to complete the amalgamation process, called *matoyong*(M).



Figure 4.2 The small drink glass bottle for storing mercury *tromol* machine (top).
A wooden carrier for transporting bottles of mercury (bottom)



The female owner accepted the offer by the operator to handle the *matoyong* stage, including whisking, sifting, and squeezing composite materials to form a gold amalgam. I observed the operator, Salim, handing a container to a middle-aged lady, Maryam, who was the owner of the material. After Salim poured all remaining materials from the centrifuges into a big plastic container, Maryam continued mixing gold and mercury liquids with her left hand. She knew that the sparkle of mercury indicated which one contained gold, along with the fact that it was heavy and stayed on the base of the container. Maryam continued to stir the heavy sparkly liquid with the fingers of her right hand to help the mercury catch all the gold in the container. Following this, she poured most of the water containing mercury on fine red fabric to sift the liquid gold amalgam and squeezed it, forming a small white gold amalgam. and put the sifting water into a large container. Then she poured the used water into the tailing.

Figure 4.3 *Matoyong* process: to whisk materials together (central upper). To sift liquid amalgam and to squeeze amalgamated materials forming a gold amalgam (left and right down)



The tailing area was located around the *tromol* machine station. It was a narrow hole approximately 3 x 4 metres wide, covered with blue tarpaulins. Used plastic sacks containing disposed fine materials from the centrifuges were placed along the edge of the tailing. An operator informed me that he sold those materials for 3000 *rupiahs* (approximately 3 cents AUD) per sack for processing it in another place. The tailing area is mainly used for panning (see a description of the panning technique in chapter three).

The female material owner collected some floating mercury into small containers to be recycled. She informed me that she could recycle those substances using calcium (*kapur*) and *komba-komba* leaves (*daun komba-komba*).¹³ She then poured the sparkly liquid submerged mercury into a small container. She sifted through a clean 10 cm x 10 cm red fabric called umbrella fabric (*kain payung*) and squeezed it to release the water into another small container, leaving a small ball of sparkly amalgam (mercury bound with gold). Finally, she took the amalgam ball and handed it to her husband. The husband went straight to the place to burn the amalgam turning it into pure gold.



Figure 4.4 The boy burning the amalgam using a hand-held gas burner

He arrived at a modest wooden stilt hut where I saw William, the *tromol* owner, supervising a young boy, Iman, burning amalgams. Iman was known as William's 'right hand'

¹³*Komba-komba* is a shrub growing wild along the road to the mining sites; these plants can also be used as a traditional medicine.

(*tangan kanan*), meaning trusted person, and he was trusted to burn the amalgam to recover the gold. The amalgam owner greeted and talked to the boy and William, and he handed the amalgam to the boy. The boy placed the amalgam nugget into a 5-centimetre diameter earthenware bowl (*tembikar*). He lit a fire under the vessel using a hand-held gas burner and pointed it at the amalgam nugget. He burned the amalgam for approximately two minutes, turning the sparkly nugget into a gold nugget. He used tongs to reposition the amalgam to burn it completely, and then to take the gold from the burning container. Then he handed the gold, approximately 4 grams, to the male owner and invited him to place it on a small black gold scale in front of William.

After weighing the gold witnessed by the owner and the boy, William took some cash from the small safe in a small, locked room in the wooden stilt house. He paid the owner some cash for the gold, worth 400 thousand rupiahs per gram (approximately \$40 AUD). However, William ran out of cash, so he wrote in his transaction book that he still owed some money to the male gold owner. He gave the male a piece of paper stating that he must give some cash to the owner. He documented all transactions he conducted per day.



Figure 4.5 The scale for measuring the weight of gold, receipts and a book for listing gold transactions



Figure 4.6 A miner who was very happy to receive money for selling gold to William, the *tromol* owner

A Drop of Mercury for Panning (*Mendulang*)

Panning is a traditional mining technique using a frying pan (*wajan/penggorengan*) to separate fine materials containing gold from raw materials using water by spinning materials into the pan with water. This technique requires relatively clear water because the fine materials hardly bond with *air raksa* in muddy water. Panning can be done with or without mercury. If the technique requires mercury, the amount of mercury used is less than a *tromol* machine.

Local Rau-rau people acknowledged that panning using mercury was a new technique introduced by mining company officers, gold buyers, and other migrant miners. For example, Ibu Suri and other local miners said that panning with mercury was unfamiliar to them when gold mining was first introduced during the gold rush of 2008. While they were familiar with *air raksa*, they needed to learn what *merkuri* was and what this chemical was used for. The miners used to pan gold along the riverbanks using a frying pan without mercury because the gold flecks were easy to pinch with their bare fingers. However, they started using mercury, which they called *air raksa* after learning about it from migrant miners, particularly once the

gold became harder to locate through panning and the texture of gold was very fine. Using mercury (*air raksa*) miners can bind gold more effectively by pouring it onto fine gold materials.

During my research observations, I found Ibu Suri (see chapter five about women in mining) and other miners frequently use mercury for panning. Ibu Suri and her companions panned in the large tailing near sluice box areas (see the mining section without mercury). They used only small amount of *air raksa*, called *satu tetes air raksa* (one drop of mercury), on the fine materials in every pan. They paid 40.000 rupiahs (approximately 4 cents AUD) for approximately 1 gram of *air raksa* liquid, and they kept the liquid in a small 200 ml glass bottle. They could not afford to buy more than this, because the mercury price is high compared to their income from selling gold. Sometimes they found gold amounting to *one kaca* (*satu kaca*) per day, but occasionally they found nothing. The concept of *kaca* is used to explain the amount of *air raksa* or gold for less than one gram. One *kaca* equals 1/10 gram, or 0.1 gram. The amount found depended on their *rezeki* (see chapter two on *rezeki*); if lucky, they could make 40 thousand rupiahs (approximately 4 cents AUD) per day. However, they could reuse the mercury if they used it carefully. One of the female miners showed me her small container of gold material from panning. Gold from panning comes from several sources, including residual materials from the trommel machine process, muddy materials in the tailing area, or raw materials and rocks from excavated hole areas.



Figure 4.7 A female migrant carrying out crushing rocks called *marempel* (*M*) (left) and gold material drying in the sun (right)

For the raw materials and rocks, miners have to conduct *marempel* (M) procedure which involves crushing rock materials and drying the materials in the sun before rinsing by panning in the nearby river. Most female migrant miners carried out this processing stage whilst juggling their domestic duties.

In Bombana, panning could not be separated from the sluice box processing method, also called the *dompeng*, *kato* or *jet* method. These mining methods do not require mercury in their processes. How panning is conducted using these techniques will be explained below.

Mining Without Air Raksa: Sluice Box Using *Dompeng*, *Kato* and *Jet*

The local terminology for the sluice box technique is *kato*, a mercury-free mining technique. *Kato* refers to a sluice box made from a long wooden rectangle box open on top. Four or five carpets, called *karpét sarang semut* (anthill carpets), are placed on the base of the sluice box, approximately 4 metres long (see chapter three about mining techniques). The *dompeng* machine or *jet* machine will suck muddy gold materials using approximately 7 centimetres of diameter pipes and stream those materials along the box where the carpets catch the gold. At the box's end is a small tailing hole covered with plastic tarp to contain water from the box.

Dompeng machine and *jet* machine have differences in terms of power capacity. The name *dompeng* comes from the name of a famous Chinese brand of sluice machine, called *Dong Feng*. *Dompeng* has more power capacity than the *Jet* machine when transporting material to the sluice box, the *kato*.

Andi Arung, the head of Mining Engineering (*Ketua Teknik Tambang/KTT*) of PT. PLM, informed me that the carpet in *kato* processing could easily catch Bombana gold because its rough texture. He added that he used the natural mercury (*merkuri alam*), and cinnabar stone (*batu sinabar*) for amalgamation. It forms rough and visible gold nuggets. However, due to a lack of information about amalgamation, using cinnabar stone is not very familiar among miners.

Although the miners claimed that those techniques are mercury-free, at the end of the processing—known as 'washing carpet time' (*waktu cuci karpét*)—miners will hasten the gold processing by adding mercury in the panning. The washing time is typically conducted in the afternoon, around 3 pm, after the miners have taken all the carpets from the *kato*. Miners collect the large chunks of gold from the carpets and then wash their carpets. The miners must ensure

they collect the water in large containers, and some people also make a designated *cuci karpet* (carpet washing) area in a small hole covered with tarpaulin. To ensure all the gold is removed from carpets, they are beaten and washed in the water. In the final stage, the fine gold materials are panned with mercury to form amalgam nuggets. The *kato* technique does not use mercury in the first stage of mining processing, but it is an effective way to gather rough gold. However, for efficiency reasons, miners have used mercury when panning the tailings after the carpet washing procedure.

Although most miners have had contact with mercury, as explained earlier, people expressed different perceptions of this substance called *air raksa* or *merkuri*. I document below what they understand as mercury according to their local languages, knowledge, and traditional culture.

'We don't use mercury but *air raksa*': Local Terminologies for Mercury

Bombana people have several terms for mercury, including *air raksa* (liquid metal or mercury), *merkuri* (mercury), *air keras* (hard water), and *air perak* (silver water). The word *air raksa* is more familiar to people in Bombana than the word *merkuri*. The mercury chemical is also called vital water (*air keras*) because it is considered a dangerous chemical or substance. People may think that those local terms refer to something different from mercury. In this section, I explain the local terminologies for the substances and describe how they are linked to the ways Bombana people perceive mercury-associated risks. Understanding the local indigenous terminologies for diseases and therapeutics will provide insights into better methods for assessing health issues and evaluating health programs (Etkin et al., 1990, p. 919; Etkin, 1993, p. 91): such local knowledge is crucial for planning meaningful and successful health and safety programs (Pelto and Pelto, 1997, p. 147).

Although Bakri (who we met in the introduction of this chapter) and most Bombana people have heard the terms *air raksa*, *air perak*, *air keras*, and *merkuri*, most know very little about the physical attributes of these chemicals; the advantages and disadvantages of using them; and whether *air raksa* and mercury have the same physical attributes. Most people know that mining activities are related to *air perak*, *air raksa*, *air keras*, and *merkuri*. Other people, particularly women, associated *merkuri* and *air raksa* with the contents of women's cosmetics

such as compact powders.¹⁴ Most miners acknowledged that mercury is a valuable chemical for gold mining and has been used intensively in Bombana mining sites. However, most believe *air raksa*, *air perak*, and *air keras* are different from mercury (*merkuri*). Moreover, some people who live far away from mining sites have never seen or touched the substances.

Local terms for mercury—*air raksa*, *air keras*, and *air perak*—can influence how people perceive mercury compounds and their potential dangers. On 25th October 2015, I interviewed Sulaiman, a Butonese migrant who had earlier worked in Riau tin mining, who reflected on this phenomenon. He told me that he saw and used *air raksa* when he worked in tin mining but did not use *merkuri*. In October 2015, he watched a TV program regarding the massive usage of mercury and its potentially harmful effects on human beings and the environment in Buru Island, located in the Province of Maluku in Eastern Indonesia. The news showed that mercury was the main reason the local government forced miners—through coercive actions such as burning their machines—to discontinue their mining activities and leave the mining sites.

From this information, he perceived that *merkuri* was a hazardous material and should not be used in mining sites. He acknowledged that *merkuri* was a dangerous material, but he was not sure about *air raksa*. Based on his experience, he did not encounter any issues using the *air raksa*. He also was not sure whether *air raksa* had the same destructive effects as *merkuri*. He said that 'Mercury is more dangerous than *air raksa*'. Smiling, he continued: 'Maybe *air raksa* can become dangerous if we drink it in large amounts'. He thought that *merkuri* as a chemical might bring disaster for humans if people used them excessively. However, he was unsure about the consequences of using *air raksa* for the human body or organisms, except that it can cause itchiness and is poisonous.

In my research, I found that mercury was part of Bombana people's traditional knowledge, as it is for Kasepuhan miners in West Java (Ellen and Soemawoto, 2010). According to folk wisdom of Sulaiman and most Bombana people, *merkuri* is a more dangerous material than *air raksa*, revealing a severe discrepancy between scientific and people's knowledge about mercury. There are ambiguous perceptions about the effects of *merkuri* and *air raksa* on humans because these different terms are used to describe the same substance. Scientists such as Trisnawaty, Emiyarti and Afu (2013) and journalists from the local printed and online media such as *Kendari Pos* have disseminated information about the potential negative impacts of mercury using the scientific term *merkuri* instead of the local term *air*

¹⁴ Mercury has been used as an ingredient for skin whitening cosmetics in Indonesia (Saraswati, 2010).

raksa. Although they highlighted the negative impacts of *merkuri* on humans, other organisms and their habitats, most Bombana people, particularly miners, do not realise or understand that *merkuri* and *air raksa* are the same substance and therefore have the same negative impacts. Miners have received little official information about mercury: whether mercury is the same as *air raksa*, how mercury should be utilised safely in mining activities, and the health impacts of mercury on different organisms, including humans.

Local Wisdom of Mercury Risks

In this section, I will explain how local people perceive the risks of mercury, locally known as *air raksa*, according to their local cosmologies. Bombana people have their own local wisdom regarding mercury risks. I will relate some stories about the various concepts of risks embedded in mercury or *air raksa/air keras/air perak* according to Bombana people.

Dita's Misfortune: Mercury Toxicity, *Karma*, and Poliomyelitis

I highlight Dita's story to depict the conflict between lay people's perceptions of mercury toxicity and those of outsiders who possess basic scientific knowledge about it. Most villagers assumed that Dita had suffered poor health conditions due to the *karma* and *bala* of her father. *Karma* and *bala* mean the consequences of behaviour, or what goes around comes around and, in this case, punishment for evil deeds (see chapter two about *bala* and *rezeki*). Villagers believe that karma means what goes around, which means that people who did good and bad actions in one of their lives believe they will get the same results in the future. However, scientists from Non-Government Organisations/NGO (Bali Focus and Medicus Foundation, 2015; Price, 2015) claimed that the symptoms of Dita's illness were typical of mercury toxicity. On the other hand, the village health professionals diagnosed her illness as poliomyelitis due to not being immunised.

Dita passed away on 31st August 2015. She was nine years of age when I visited her between April and August 2015. Dita was lying in yellow shorts without a top on a 1.5 x 3-metre small green mat in a bamboo hut. Her hair was cropped short. Her upper body was skinny; most villagers used the expression 'leather wrapped bones' (*tulang terbungkus kulit*) to describe how emaciated she was.

Dita had skinny legs, and the toes on her left foot were stuck together and stiff. Her thin right arm looked normal, but her left arm was bent rigidly backward, and her fingers were stuck together. She often suffered convulsions, constantly moaned, and randomly moved her body when she reacted to something. Her mouth was wide open most of the time, showing her front teeth with saliva dribbling down her chin. This severe condition began when she was around three years old. Although Dita's family's house was made from bricks and timber, her mother said Dita stayed in an attached bamboo stilt hut that they used as the kitchen (*dapur*). She lived only with her mother Kustin, because her father Suwardi had left them and had not visited them since Dita began showing signs of illness.



Figure 4.8 Dita with her mother Kustin during the photo session with a photographer from Pulitzer International

Photographers, health professionals, and scientists from national and international non-governmental organisations (NGOs) outside the Rau-rau community have portrayed Dita as the victim of mercury toxicity resulting from the gold mining activities in Bombana (Bali Focus and Medicus Foundation, 2015; Price, 2015). During my visit to Dita's house in April 2015, I met Larry, a photographer from Pulitzer International, two doctors and scientists from NGO Medicus and NGO Bali Fokus. The Bali Focus and Medicus Foundation staff, funded by the

Australian Aid-funded Artisanal Mining for Development in Eastern Indonesia Project,¹⁵ investigated the use of mercury in Bombana small-scale mining and determined that Dita was suffering from mercury poisoning.

The reporting of Dita's disease (Price, 2015) is an instance in which scientists have used the media to highlight how the community and government should raise concerns about the negative health impacts of mercury on human beings. According to science, mercury is a dangerous substance that can cause 'paralysis and neurological problems in young children (Bose-O'Reilly, Lettmeier, Gothe, Beinhoff, Siebert & Drasch, 2008; Bose-O'Reilly, McCarty, Steckling, & Lettmeier, 2010). Dita was one of several children who were alleged to have mercury toxicity resulting from the massive mining activities involving mercury (Bali Focus and Medicus Foundation, 2015; Price, 2015). Notably, no pathology tests supported the diagnosis based on Dita's symptoms.

Health professionals have various explanations regarding Dita's symptoms and disease. Sukma, the only nurse in Rau-rau, said that Dita's mother took Dita to the community health service in Taubonto and the hospital in Rumbia. There the doctors diagnosed Dita's disease but could not explain the cause of her disease and her symptoms. The village nurse whispered to me: 'Do you know people in this village? They do not want to immunise their children because they do not want their children to get hurt by needles, and instead seek a traditional healer (*dukun*) if they are sick. I am sure around 90 per cent of people go to the *dukun* before consulting medical professionals. Sukma, trained as a village nurse, was sure that Dita suffered from poliomyelitis (*penyakit polio*) because she knew she was not immunised when she was a child. She had extremity paralysis, which is common among children with poliomyelitis. Halsey and Galazka (1985, p. 1151) argued that infants should have DPT immunisation early in life to prevent them from developing poliomyelitis.

However, Rau-rau villagers had their explanations—in line with their traditional wisdom—regarding Dita's disease. They linked Dita's illness with *karma* and *bala* resulting from her father's transgressions. One day, on my return from a visit to Dita's house, Arul—the youngest child of Rais, the head of Rau-rau village—told me that according to his mother, Dita was sick because she had been beaten by *setan* (satan/ghost). His two sisters agreed with him. When I asked their mother, Rosnia to elaborate, she revealed that most villagers believe that Dita suffered from this frightening and unusual disease because of her father's *karma* and *bala*.

¹⁵ <https://asm4d.wordpress.com/>

The villagers believed that Dita's condition was a punishment meted out by Dita's grandfather because her father had tortured him. Dita's father had placed her grandfather in a small stone and bamboo hut at the back of their house. Her father burned a fire under the hut, and her grandfather inhaled the smoke and suffered burns. After that, he became very ill and died a year before Dita became sick. People did not understand why Dita's father did such horrifying acts to her grandfather. However, almost every person in the village believed that the grandfather had evil spirits, evil *jinn* (see chapter two about *jinn*) when he was alive. They believed his *jinn* friends had avenged Dita's father on behalf of her grandfather by making Dita sick. As Dita was the apple of her father's eye, the *jinn* made her sick so that he could feel her grandfather's pain. People believed that the innocent Dita had to shoulder her father's *bala* and *karma* or sins by contracting a severe disease as his punishment for her grandfather's exorcism.

Dita's parents and most villagers rely heavily on *dukun* or *tolea* (M) or spirit mediums to cure their illnesses and diseases. According to a survey I conducted with more than 400 respondents, almost 90 per cent of the villagers visited traditional healers (*dukun*) and spirit mediums (*tolea* (M)) when they became sick. According to their traditional cosmologies, sickness, illness, and disease are always connected to *bala*, *karma* or *sial* (misfortunes), caused by *jinn*, *setan* (ghosts), *arwah leluhur* (spirit possession) or *roh/mahluk halus* (soft creatures). Moreover, most local people relate diseases to moral dangers such as transgression and sin (Douglas, 1966; 1985; 1992; 1997; Douglas and Wildavsky, 1982). Western understanding of health, disease, and cause and effect are not part of local cosmologies. Douglas (1970) notes about natural symbols of local cosmologies incorporate local cultures. I argue that mercury has yet to be included in the traditional cultural cosmologies of Bombana people as a determinant of disease.

People in Rau-rau village are similar to Kasepuhan people, who likewise have not recognised mercury as a component in their traditional cosmologies because this substance is viewed as a modern commodity (Ellen and Soemawoto, 2010). For instance, in Dita's case, it seems that the perceptions of health professionals—such as Sukma, the village nurse and the outsider scientists (Bali Focus and Medicus Foundation, 2015; Price, 2015) —do not correspond with laypeople's traditional cosmologies. Most villagers have categorised and explained Dita's case according to their traditional languages, norms and communal beliefs. They indicated Dita's symptoms as indicators of moral dangers through health catastrophes. These moral dangers include sin, transgression, punishment, and sickness (Douglas, 1966; 1985; 1992; 1997), or in the local language, *bala* and *karma*. People tend to label or judge experiences according to their pre-existing knowledge and culture (Douglas, 1966).

'Mercury would not make us die': Immediate Impacts of Mercury and the Apparent Inconsistencies of Knowledge, Attitudes, and Behaviour

People perceive *merkuri* or *air raksa* as a dangerous material based on their experiences. In this section, I will show how some Bombana people perceive the risks of *merkuri* and *air raksa* according to its direct impacts on their lives.



Figure 4.9 Arifah with gold and mercury amalgam burning equipment

I met Arifah, a gold buyer and vendor for *sembako* (basic staples) and mining equipment, when I visited her stall to buy a bottle of mineral water. She was burning amalgam near her five-month-old baby, who was sleeping in a sarong sling. She admitted that she did not know that *air raksa* and *merkuri* have the same chemical substance. She had learned from her sister, who studied public health in Hasanuddin University, about mercury's effects on human health and that it was a dangerous chemical for humans, particularly babies. However, she needed to make money by selling gold to help her family survive. She had not noticed any problems since she had been handling mercury for a while. She also had not experienced the

harmful physical effects of *air raksa*, and consequently perceived *merkuri* (mercury) as a safe substance. Those reasons had encouraged her to keep handling mercury.

Another case arose when two officers from *Badan Lingkungan Hidup* (BLH Bombana) accompanied me to mining sites in the Rau-rau outskirts. In our conversation on the journey, those BLH staff members expressed their concerns about the massive use of mercury in Bombana mining and its potentially damaging risks for humans and the environment. They impressed me by saying that BLH officers have a duty of care to stop using mercury because it risks adverse effects on humans and the environment. They also acknowledged that because the adverse effects of mercury were invisible to most, the people and the government ignored them. However, when we arrived at one of the *tromol* sites in the Roko-roko mining site, the BLH officers approached a male miner involved in the amalgamation process. They took turns stirring the mercury liquids in a plastic bowl with their bare right hands. Suddenly, the male officer asked me to join them in touching the mercury, but I refused to touch it. The female officer said that this was the first time she had seen such beautiful sparkling mercury. Despite their knowledge that mercury is poisonous, they kept touching it. The male officer stated, 'Mercury would not make us die. His actions seemed to contradict with his earlier statement.

Those examples illustrate how government officers and miners have not taken into account the potential risks of mercury because they themselves have not personally experienced adverse physical effects of mercury, jeopardising their lives. Even though Arifah and BLH officers were aware of the dangerous effects of mercury on humans, they ignored this knowledge and their behaviours included touching and handling mercury. Ignorance can influence people to act differently with pre-existing knowledge (Hope, 2005, p.76).

Health Professionals' Discrepancies in Knowledge of Mercury Risks

Health professionals who worked in Rau-rau village also exhibited a lack of knowledge about mercury and its potential negative impacts on humans, living creatures, and the environment. In a *posyandu/pusat pelayanan terpadu* (integrated health post) meeting, I probed for information about mercury from two assigned health professionals in the villages: a midwife (*bidan*) called Rosmiati, or Bidan Ros, and a nurse (*suster*) called Sukmawati, or *Suster Sukma*. Bidan Ros stated that even though she sometimes helped women giving birth in the mining settlements around Tahi Ite village, she had never heard people talking about mercury. Moreover, she never saw people using it. However, she noted that she had learned

the word mercury while studying chemistry in high school. In nursing school, she became familiar with using medical equipment containing mercury, such as a thermometer to measure temperature. Meanwhile, Suster Sukma acknowledged that most villagers have mentioned mercury or *air raksa* for mining purposes, yet she had not seen real mercury being used in mining. She possessed some knowledge of mercury's negative health impacts, such as cancer and itchiness. However, she admitted that she still needed more information to enhance her knowledge about mercury, and she hoped the community health centre (*puskesmas*) could provide all village health professionals with training about mercury, including how to diagnose people with mercury poisoning and how to cure them.

The examples of Ros and Sukma illustrate that health professionals who work in Bombana mining areas need more knowledge and information about the negative health impacts of mercury. Consequently, they have difficulty identifying mercury and associated unsafe behaviours, which could lead to adverse health outcomes in the community. Furthermore, they have limited skills in diagnosing someone affected by mercury. Ideally, health professionals working in the frontier areas of mining should have correct information about mercury; prior knowledge and skills are needed to help miners deal with mercury in mining. With training in the safe handling of mercury and what personal protective equipment should be used, health professionals could build on their knowledge about treating people with mercury toxicity. Also, they would be able to educate miners in their neighbourhoods about safe mercury use to mitigate the risks and prevent the adverse health effects of mercury in the community. Fortunately, the Department of Foreign Affairs and Trade (DFAT) of the Australian Government, through the Government Partnership for Development Program's (GPFD) Artisanal Mining for Development in Eastern Indonesia Project,¹⁶ has sponsored training for health professionals and midwives in early detection of mercury toxicity in the health department office since April 2015.

The head of the health department, and his team members, were very grateful to have the training because they found it was very effective to increase health professional knowledge and skills in dealing with mercury issues in Bombana mining. The GPFD training educated health professionals to clearly diagnose the diseases and symptoms relating to mercury contamination. The health professionals and public health officers received information to pass on to community members about mercury contamination contributing to water pollution and how mercury toxicity that resulted from gold mining. I will explain how some residents have

¹⁶ <https://asm4d.wordpress.com/>

knowledge from health professionals about mercury contamination symptoms resulted from water pollution due to mercury uses in gold mining activities.

'When the water is no longer friendly': Water Pollution and Waterborne Diseases

Before the massive mining activities began in Rau-rau village, the river water was viewed as a safe natural resource. They utilised the water for domestic purposes such as cooking, washing, and bathing. Rivers were also used for recreational activities such as swimming and social gatherings.

Following the gold rush era, people perceived river water as a friendly substance that had turned unfriendly. Duna, one of the farmers who relied heavily on water from the contaminated river, told me that 'the water was no longer friendly for us' (*air tidak lagi bersahabat dengan kita*). According to Duna, 'unfriendly water' meant the water in the village river had been contaminated by mercury from mining activities and was no longer safe to use in people's daily lives. She got this information from the village nurse who treated her itchiness due to dermatitis (*penyakit kulit*).

Duna's argument reflects community concerns about water pollution resulting from mining activities. Members of the Bombana community viewed water pollution as problems for the community, particularly those who live near contaminated water. Water pollution has been viewed as a potential public danger to the community (Wildavski and Douglas, 1982, p. 14). The picture below explains the process of water pollution resulting from mercury contamination from gold mining activities. The main concerns with mercury are its water pollution and wider negative effects on organisms and their habitats or environments through the food chain. Figure 4.10 above illustrates the cycle of mercury in the food chain due to mercury pollution in water.

Scientifically, mercury can contaminate humans in the Bombana community through both its inorganic form (elemental mercury) and organic form (methyl mercury). Inorganic mercury is naturally present in the environment as a shiny liquid formed in an anaerobic environment and can be transformed into highly toxic organic mercury. It is known that mercury can cause permanent damage to the nervous system. Transmission of mercury into human bodies occurs through the skin and by inhalation via the nose and mouth. Contamination through inhalation causes faster mercury toxicity in humans than other modes of entry (WHO and UNEP, 2008, pp. 2-3).

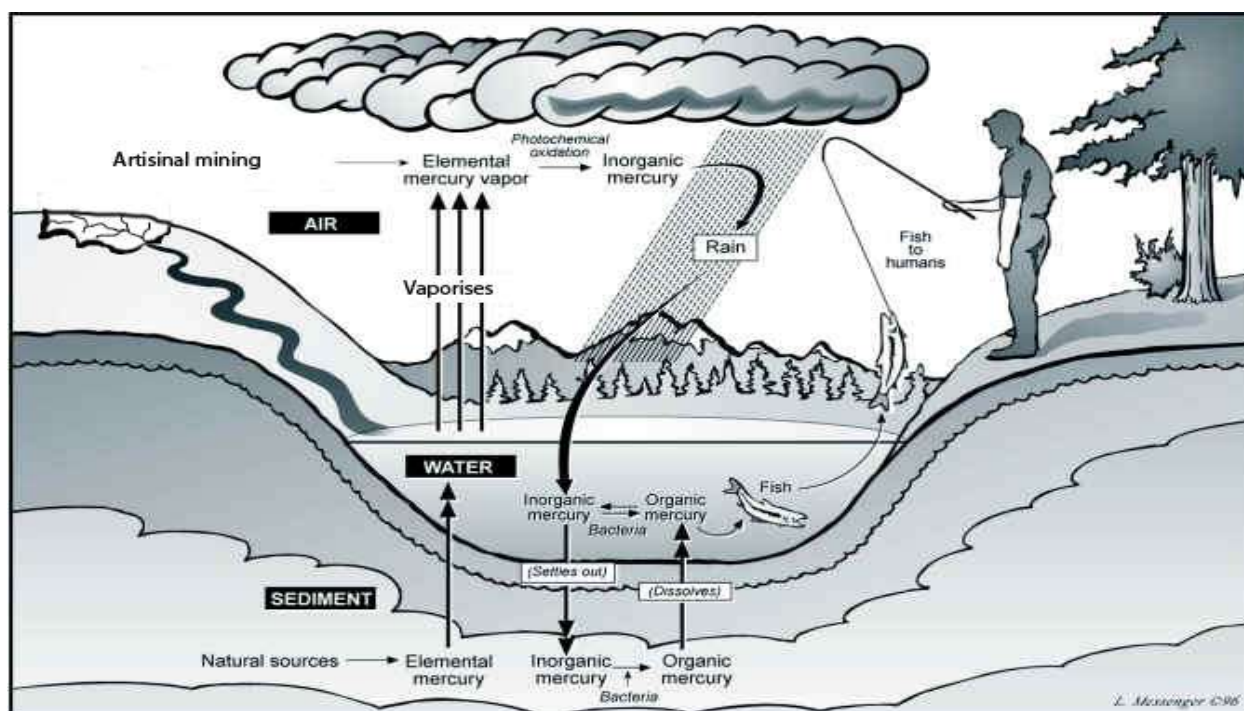


Figure 4.10 Cycle of Mercury Contamination in the Water Cycle and in the Food Chain
Source: Sara Beavis, 2015, Adapted from USGS, 2000)

Researchers (Harada, 1978; 1982; 1995; Castilhos, Bidone & Lacerda, 1998; Harada, et al., 1999; Ha, Basu, Bose-O'Reilly, Dórea, McSorley, Sakamoto & Chan, 2017) assert that mercury is a poisonous chemical that can negatively affect human health. Water contaminated with mercury can cause both Minamata disease (Harada, 1978; 1982; 1995; Masazumi, 2005) and congenital cerebral palsy (Harada et al. 1999). It can also have a neurotoxic effect (Azevedo et al., 2012) related to brain damage resulting from the long-term accumulation of mercury in human bodies. The common symptoms of mercury toxicity are ataxia, neurobehavioral deficits, neuronal loss, visual disturbances, impaired hearing, paralysis, and death (WHO and UNEP, 2008, p. 29). Children living and working in small-scale mining sectors who are in contact with mercury from an early age are likely to experience serious mercury toxicity (Bose-O'Reilly, Lettmeier, Gothe, Beinhoff, Siebert, & Drasch, 2008, p. 89). Mercury that metastasises in breast milk becomes a health hazard for infants in gold mining areas (Bose-O'Reilly, et al., 2008). However, the total affliction of mercury intoxication is likely under-calculated (Steckling, Tobollik, Plass, Hornberg, Ericson, Fuller and Bose-O'Reilly, 2017). They estimated that 'between 25% and 33% of 3.3 –6.5 million miners globally' have moderate Chronic Metallic Mercury Vapor Intoxication (CMMVI) according to human bio-monitoring data (Steckling et al., 2017, p. 994).

The initial negative effects of methyl mercury were first reported by scientists from Japan (Harada, 1978; 1982; 1995; Harada et al., 1998; Harada, et al 1999), who found that mercury was the leading cause of congenital Minamata disease among the Japanese. The researcher found that the Chisso Minamata industrial plant, which owned a chemical fertiliser plant, used mercury suspected to have caused the disease (Harada, 1995, pp. 3-4).

Since then, the adverse effects of mercury resulting from gold mining activities have been a concern of researchers worldwide (for instance, see Castilhos et al., 1998; Bose-O'Reilly et al., 2008; Bose-O'Reilly et al., 2010). When mercury goes into the water or soil, or human beings handle it, there are negative health consequences (Veiga et al., 2006), particularly for children (Bose-O'Reilly et al., 2010). As noted earlier, mercury can also be present in breast milk, resulting in a health hazard for infants (Bose-O'Reilly et al., 2008), and long-term mercury exposure could negatively impact children's health and development (O'Reilly et al., 2010). In addition, humans are affected by mercury through eating mercury-contaminated fish and water (Castilhos et al., 2006) and rice (Pateriya et al, 2021).

In Indonesia, researchers have emphasised the negative impacts of mercury on humans and the environment—including contaminated water, soils, and rice—as a result of mining activities.¹⁷ Illegal gold mining activities in regions of Indonesia such as Sulawesi, Kalimantan, and Nusa Tenggara have resulted in massive mercury pollution (Aspinal, 2001). Mining activities in North Sulawesi have contaminated coastal areas (Limbong et al., 2003; Limbong et al, 2005) and aquatic biotas (Kambey, Farrell & Bendell-Young, 2001). The mercury in contaminated sediments increases the mercury level in local fish in Kalimantan (Bose-O'Reilly, et al., 2010). In addition, mercury has also polluted rice and paddy fields in Lombok, West Nusa Tenggara (Krisnayanti et al., 2012).

In Bombana, scientists have claimed that Bombana mining activities have contributed to mercury pollution of the water bodies around Bombana (Trisnawaty, Emiyarti & Afu, 2013; Beavis, 2015; Beavis and McWilliam, 2018). Mercury has contaminated the water around the Tahi ite River on which many paddy farmers in Rau-rau village rely for water for their paddy fields and domestic purposes (Trisnawaty, Emiyarti & Afu, 2013). Hydrologist Sara Beavis and anthropologist Andrew McWilliam (2015) have also asserted that mercury has polluted the

¹⁷Key researchers include Aspinal (2001); Veiga et al. (2006); Bose-O'Reilly et al. (2010); Filho et al. (2004); Castilhos et al. (2006); Blackwood and Edinger (2007); Edinger et al. (2008); Kambey et al. (2001); Kono et al. (2012); Krisnayanti et al. (2012); Limbong et al. (2003); Limbong et al. (2005); Male et al. (2013); Nakazawa et al. (2016); Palapa and Maramis (2015); Tomiyasu et al. (2013); and Yule et al. (2010).

water and soil in areas around rivers that flow through Rau-rau village and Wumbubangka village where miners mine gold.¹⁸

Beavis and McWilliam (2018) reported that a group of collaborative researchers, from NGO BaliFocus, and researchers from an Australian government-funded project¹⁹ have conducted research to measure mercury levels in the air in Rau-rau village and Wumbubangka Village. The airborne mercury measured was 54,931 nanograms per square metre (ng/m³). This number was significantly different, which is more than double the Indonesian safety standard (> 25,000 ng/m³) and greater than the standard imposed by the World Health Organisation (WHO) and US Department of Health and Human Service's safety standard, which is 1000 ng/m³. Conducted in the same river, in Tahi Ite River the levels of mercury in stream water and in-bed sediments were measured through samples selected to cover upper, middle, and lower parts of the two catchment areas where gold production or processing activities were identified. The results showed that mercury had accumulated in the system, with some concentrations between 70–520 µg/litre, above the limit considered safe by the Indonesian standard (~1 microgram per litre (µg/litre)) or even WHO's standard (6 µg/litre for an adult of 60-kilogram body weight with daily water consumption of 2 litres).

Basri, Sakakibara and Sera (2017)—researchers from Makassar School of Health Science (*Sekolah Tinggi Ilmu Kesehatan Masyarakat/STIK*) and Ehime University in Japan—also argue that mercury has contaminated people and the environment in Bombana mining. They analysed hair samples of miners who were directly and indirectly exposed to mining, concluding that the directly exposed group had 12.82 µg/g hair and the indirect exposed group had a median of 7.64 µg/g hair, $p < 0.05$) compared to the control group with a median of 4.8 µg/g hair, $p < 0.05$) (Basri, Sakakibara and Sera, 2017, p. 1). Moreover, mercury had also contaminated the food chain, consumed by people around Bombana mining sites. Basri, Sakakibara, Sera and Kurniawan (2017) compared the level of mercury on cattle hair samples farmed within and outside the mining sites, finding that cattle farmed within the small-scale mining areas showed a significantly higher mean of Hg (11.44 µg/g hair) compared to those farmed outside the area (2.89 µg/g hair, $p < 0.05$) (Basri, Sakakibara, Sera and Kurniawan, 2017, p. 1).

¹⁸ The team conducted a survey in May 2015. This activity is separate from the research of the Artisanal Small Scale Gold Mining/ASGM Project-Ausaid, The Australian National University, Charles Darwin University, Haluoleo University, and Environmental Agency of West Timor. For further information, visit <https://asm4d.wordpress.com/>

¹⁹ See the project website at <https://asm4d.wordpress.com/>

The local government officers from Bombana Local Health District and Bombana Environmental Agency have also frequently voiced the potential negative risks of mercury, generating high public concern in the local and national mass media, particularly printed and online media. However, some officers (see the BLH officers story) practically ignore the issues of mercury in real life. The ignorance is not merely lack of knowledge but much more related to moral judgment (Hope, 2005). In this case, BLH officers judged *merkuri* or *air raksa* as safe substances because they did not experience immediate danger after using the mercury chemical.

Unlike the traditional perception or local knowledge about mercury (see Dita story), some people in Bombana have more modern understanding about mercury. They know that mercury pollution can generate water-borne diseases such as diarrhoea and dermatitis. This is based on the severe negative health impacts they have experienced. Duna, a grandmother of two girls who lives along the coast near Poleang River, revealed that she suffered from severe diarrhoea after she consumed water from the river behind her house. The Tahi Ite River, which has been massively contaminated by mercury (see Trisnawaty, Emiyarti & Afu, 2013), flows to the Poleang River before going to the Poleang Sea. Wayan, a village nurse, diagnosed the severe diarrhoea due to *entamuba coli* (e-coli) and referred Duna to the Rumbia hospital to be hospitalised for two weeks in March 2015. Duna was terrified because she almost died of the disease. The village nurse told her that her disease was caused by water she had consumed that contaminated by pollutant such as mercury, mud or faeces. She informed me that this might be true, because previously the water was very clear compared to its muddy condition now. She sometimes drink the water without boiling it through natural purifying method.

She had been consuming the river water for approximately 30 years by purifying it using seashells called *poteng* (*M*). She placed the alive seashells in turbid water overnight or 7 days in a container or bucket. After one or several days—depending on the number of seashells and the amount of water—they will produce clean water.

Duna and most other villagers have long used the river water for domestic purposes such as cooking and washing, claiming that no significant problems had arisen over many years. She claimed that the water had become muddy since mining started around Rau-rau village, where the main Tahi Ite River/Kasutahi River flows to the Poleang River, from which Duna drew the water for her daily use.



Figure 4.11 Duna seated in front of her house, behind which the Poleang River flows. She holds a seashell (*potteng*) used to purify the muddy water from the river for daily drinking water

Dondu, a senior resident based in Wumbubangka village, suspected that his symptoms were due to mercury pollution. He experienced severe itchiness on his skins *penyakit kulit* (skin disease, or dermatitis). He complained of continuous itchiness due to intensive contact with water polluted with mercury during his one year of panning. When Dondu could no longer handle the pain and annoying itchiness, he went to the community health centre (*puskesmas*) nearby. However, the medicine he was given did not ease the itchiness. Also, he was unable to find cream to reduce the itchiness from chemists and medicine stores around Bombana and Poleang districts. He then arranged a trip to Kendari (the main city of Southeast Sulawesi province) to visit a specialist skin doctor and spent a lot of money on medicines and medical consultation fees. Dondu also visited some traditional healers (*dukun*) to obtain therapy and medicines. However, his itchiness remained. Consequently, he decided to stop panning to avoid further itchiness. This disease not only created an unpleasant condition for him, but also resulted in a heavy financial burden for Dondu and his family.



Figure 4.12 Dondu blamed mercury for his painful dermatitis

Another miner, Iwan, self diagnosed, concluding that mercury had damaged his right eye when he could no longer see through that eye. He remembered the old days when he had washed his face with fairly clean water in a tailings dump after he had finished his *dompeng* activities. When he went home, he felt itchiness in both eyes and kept rubbing them. Iwan's left eye was getting better, but his right eye became red. He applied some eye drops to his right eye, but its condition worsened, resulting in whiteness, and he can no longer see with this eye. He went to the local community health centre (*Puskesmas*) to get diagnosed and treatment for his right eye. However, the doctor there had no knowledge and skills regarding mercury contamination and diagnosed that his eye condition was due to bacterial contamination from camp site or other factors. The health professional gave him eye drops and some medicines to take. The doctor also asked him to take a lot of rest and have a break from mining activities.



Figure 4.13 Iwan's right eye was damaged due to mercury

The mercury pollution in water has not only caused human diseases but has also had a negative impact on cattle. Ponirin, the head of the North Rarowatu sub-district, revealed that around ten young bulls died in one year. He suspected that soil contaminated by mercury was the main cause of this. He also acquired information from some officers who work for the District Department of Mining and Energy indicating that some domestic water sources had been contaminated by mercury.

Overall, many Bombana locals have seen this water pollution as a health calamity posing dangers for humans and the environment because of its immediate impacts, rather than its long-term impacts. From their traditional perspective, the water pollution by mercury not only causes human disease but also affects the animals that support their livelihoods. People were more concerned about the immediate impacts of water-borne disease related to short-term mercury exposure (Hinton, Veiga, & Beinhoff, 2003), including diarrhoea, blindness, and itchiness. This is because those illnesses and diseases are visible and have interfered with the victims' normal daily lives. These impacts are easily integrated into people's traditional cosmologies. However, people do not seem to understand the long-term negative consequences of mercury contamination of water.

'Save this Southeast Sulawesi paddy granary': Mercury Pollution and Politics

The issue of mercury contamination, particularly water pollution resulting from gold mining activities, is entangled with health politics and justice issues. Scientists and the local media have long raised concerns about the negative effects of mercury on people's health and the environment. However, local politicians have seen the rumours about mercury-polluted water in riverbanks, soils, water, organisms, humans, and the environment in Bombana as a critical issue that can negatively affect the economic security of the district.

Whenever the mass media headlined news of mercury contamination, the local government reacted swiftly. One of the Bombana politicians confided to me that he wished that scientists would not expose the real issues of water contamination by mercury around Bombana to the public, because it could threaten the economic situation of Bombana. This land is well-known as the paddy granary of Southeast Sulawesi, supporting agriculture and generating revenue for the local government (*Pendapatan Asli Daerah/PAD*). He also argued that by allaying public concerns about mercury contamination, we could uphold justice for the farmer and miners. This is because miners are looking for money to survive and they are the ones who will be affected by mercury pollution rumours. In the worst cases, the paddy distributors do not want to buy their paddy if it is contaminated by mercury. This situation could lead to a decline in paddy distribution to other areas outside Bombana, thus lowering the local revenue.



Figure 4.14 Paddy fields along Bombana's main road

Equivocal Perceptions of Mercury's Illegal-Legal Status

The status of mercury among the Bombana community is uncertain. Bombana society was dubious about whether mercury was legal or illegal according to Indonesian law. Some people perceive mercury as a prohibited substance because mercury can contribute to water pollution. Other people, including most miners, assume that mercury, locally called *air raksa*, can be legally used for mining activities. I argue that these equivocal perceptions regarding the legal or illegal status of mercury are influenced by a lack of information dissemination regarding the law and regulations within Bombana society, as well as other factors such as politics, morality, social concerns, and culture that will be explained in the sections below.

Mercury Laws and Absence of Political Will

Mercury regulations are not stand-alone or written and expressed in a single law; rather, mercury laws are spread across institutions from the national to local level. Mercury is listed as a hazardous and toxic material (*Bahan beracun dan berbahaya/B3*) according to Indonesian Presidential Decree No. 101 in 2014. This law regulates the management of hazardous and toxic waste—classified as B3 substances—which includes mercury. This is an umbrella regulation that mandates all institutions form their own regulations according to their job descriptions. The Ministry of Trade has several regulations relating to B3 that specifically regulate inorganic or organic mercury compounds, which are not chemically defined. The first regulation was promulgated in 2009 with the law *Permendag* No. 44/M-DAG/PER/9/2009, which dealt with the supply, distribution, and supervision of B3. *Permendag* No. 23/M-DAG/PER/9/2011 replaced the previous regulation. Another regulation—No PM-01PK76MPE—came from The Indonesian Ministry of Mining and Energy in 1991 and orders the mining industries to follow a document called Environmental Impacts Analysis (*Analisis Mengenai Dampak Lingkungan or AMDAL*) to monitor negative impacts, including mercury, before receiving mining concession licenses. In addition, the Labour Ministry Decree No. 187/1999 regulates the classification of B3, highlights single or combined forms of mercury that are classified as dangerous for workers and the environment, and stipulates guidelines for how to handle these chemicals.

The Ministry of Environment and Forestry decree Law (No. 7) in 2014 dealing with environmental pollution and damages, including the revocation of mining companies' licences

if they fail to implement the Minamata Conventions signed by the Ministry of Environment in January 2013 in Geneva. The Ministry of Health has also established Health Ministry Decree No. 453/Menkes/Per/XI/1983 regarding B3 chemicals and regulating how to manage them. Another Law, No 62, emerging from the Health Ministry in 2013, forbids people from donating their cells and organs if they are contaminated by mercury.

The central government established a decentralisation law—Indonesian Republic Law No. 32 in 2004—stipulating that local governments can initiate their own regulations (decentralisation), including those that address mercury use related to mining activities. Some local governments have taken this opportunity to establish a law about mercury in mining activities, such as the West Kalimantan Government with its local regulation (*Peraturan daerah or Perda*) No. 4 in 2007. However, the Bombana district has not established any local laws related to mercury and continues to implement the national regulations. Having said that, the local government in Bombana has not fully implemented the national laws in the mining communities. The Ministry of Energy and Mineral Resources made a national commitment to ban the use of mercury in all mining industries, yet information about this national commitment has not been disseminated through the relevant institutions of Bombana local government (see chapter seven), such as the health department, the mining and energy department, and the environmental agency. Enforcement of laws regarding mercury use is still far from the ideals expressed in government documents.

Issues on Enforcements of Mercury Laws

The Bombana Police play an important role in enforcing the established mercury laws in the community. However, they also face difficulties in enforcing the mercury laws because of some discrepancies in the laws and its implementation. Indeed some police officers do not have knowledge about the physical substance of *air raksa* or *merkuri*.

In March 2015, Muskid, the head of the section controlling B3 in the District Bombana Police office, expressed the following concern:

It is hard for us [the police] to apply the environmental law regarding B3, particularly mercury. The laws [that regulate mercury] mention only the distributors, not the end users. Besides, you can imagine how many miners would go to jail if we arrested all people who use mercury in mining activities. We can do nothing with the miners even if the BLH reports the negative environmental impacts of mercury. Furthermore, we

have a limited budget to process all environment-related problems. We only have 20 million rupiahs (around 2000 AUD) in our annual budget to cover all criminal problems relating to drug usage and use of dangerous substances such as mercury.

The police are only permitted to arrest mercury distributors and not individual end users such as miners. The police will convict an individual or group if the BLH has reported and lodged legal complaints about them. However, the police and BLH require legal evidence to prove that the suspects have been using mercury in a way that breaches environmental laws. Police are not allowed to arrest mercury users without a complaint being lodged by the local environmental agency, which is the BLH officer. In addition, addressing the illegal use of mercury in mining has not been prioritised due to the lack of financial and other facilities to process the large number of cases of mercury misuse.

Despite those discrepancies, the police—along with the Bombana environmental agencies—have convicted some irresponsible mercury distributors and some users who mined near the dense community settlement in Rumbia, the capital city of Bombana, after the community protested. However, the cases of mercury misuse in Bombana were discontinued due to lack of legal evidence (Dar, 2015).

'Mercury is not haram': Islamic Morality and Mercury's Legal Status

Morality, influenced by Islamic and cultural values, also fosters ambiguous perceptions about the legal status of mercury in the community. On one occasion, Makmur, the head of the Environmental Impact Analysis or *AMDAL* section of the Bombana Environmental Agency, stated that "*Mercuri tidak haram* (mercury is not haram)". *Haram* is a strong word in the Islamic community, used to emphasise that something is strictly prohibited according to the value of the Quran of Allah, the only God in whom Islamic people believe. Makmur wanted to emphasise that mercury is a legitimate substance according to Islamic values, which are upheld by most of the Bombana community. People who use mercury would not be discriminated against in the same way as those who use forbidden goods such as alcohol, which is categorised as *haram* according to Islamic values. In addition, people who use mercury would not be arrested by the police. Some people believe that mercury is neither *haram* nor *halal* (something allowable according to Islam) (see chapter two about the morality of *rezeki*).

The common argument as expressed here by Makmur: that mercury is not *haram*, contributes to the factors by which the Bombana community judges mercury as legal or illegal. His moral judgment about mercury not being a forbidden substance—and therefore not taboo according to Islamic values—shows that mercury is not only political, but also sits within the moral sphere of lay people.

As the head of the *AMDAL* section of the Bombana *BLH*, Makmur revealed that he knew that mercury is still used regularly by the Bombana miners. He stated the substance is still legal under Indonesian Laws and can be utilised by mining companies with some limitations. To obtain permission to use it, mining companies must provide evidence of adequate standards for the use of mercury in their permit, titled *AMDAL*. This *AMDAL* makes it legitimate for them to use mercury under BLH supervision (see chapter seven). In addition, if mining companies are recognised as legally able to use mercury in their mining operations, the miners who are indirectly working for them under their *mitra* systems should have the same legal status to use mercury.

‘*Jual di bawah tangan*’ (Sold underhand)/Sold under the) table: Black Market and Mercury Supply Chains

The perception that mercury is illegal in the Bombana community has forced people to trade mercury illegally. The theme that emerged when I asked people about the market for mercury was that mercury is sold underhand (*merkuri dijual di bawah tangan*), meaning it was sold secretly on the black market. There is no legal market for buying or selling mercury. The supply chain of mercury is categorised as a 'black market' because some miners perceive mercury as an illegal substance and anyone buying or selling it would be targeted by the police. People were not sure about this matter, but admitted that they thought they should act to avoid being arrested by the police. In mining practices, the end users or miners mainly use mercury in public areas, in full view, although some hide mercury in drinking bottles. Thus the supply chain of mercury in Bombana was associated with local perceptions about the illegal status of mercury in mining activities.

My investigation into the supply chain of mercury in Southeast Sulawesi began with an interview with the head of the Dangerous Goods section (*Kepala Seksi B3*) of the Provincial Trade Department. She revealed that no companies in Southeast Sulawesi fulfill the Centre for Drug and Food Control (*Balai Pengawasan Penggunaan Obat dan Makanan/BP-POM*) criteria

as a reputable mercury supplier. The only company credited to distribute mercury was the Great Hall Pharmacy (*Balai Besar Farmas/BBF*) in Kendari, which supplies mercury compounds to hospitals, dental practitioners, and pharmacists across Southeast Sulawesi. The Trade Department has the responsibility for controlling the main distributor, whilst the *BP-POM* controls the amount of mercury distributed to every end distributor. I checked with the *BP-POM* and learned that not every pharmacist was permitted to sell mercury; to do so, they must possess special licenses. More mercury is stocked in hospital pharmacies than in other public pharmacies. Mercury is designated for medical purposes only—particularly for dental purposes, in teeth fillings—and is not designated for use in mining.

However, mercury is easy to obtain in mining sites; as some miners revealed, it is as easy to sell as fried nuts (*kacang goreng*), albeit behind closed doors (*di belakang pintu*). This means that miners can easily buy mercury from local vendors. Most miners who pan for gold revealed that they purchase *air raksa* from the gold buyers and from grocery stores selling mining equipment. Some miners buy mercury from other miners on an individual basis. No mercury vendors revealed where they had obtained large amounts of mercury. I heard from the villagers and miners that mercury was smuggled from West Nusa Tenggara, South Sulawesi, and North Sulawesi. The mercury vendors do not display the chemicals and keep them inside their houses to avoid being noticed by the police because they are aware that they are considered illegal distributors of mercury.

Miners and gold buyers as end users have developed camouflage strategies to hide mercury. Some miners place mercury into small—approximately 200 grams—energy drink bottles, such as a *M150* drinking bottle or a *Kratingdaeng* bottle. In *tromol* areas, around ten of these bottles are placed in a wooden tray. Some women miners who carry out panning try to hide mercury inside small cosmetic containers, such as unused powder compacts. Although mining companies have been given the authority to use mercury, I discovered company staff or field supervisors would also hide mercury inside empty cigarette lighters and hand them to field staff (those doing the panning). In another company, I saw mercury being placed into a bottle with a tag saying 'mercury' when they carried out gold amalgamation processing in their special room.

The prices for mercury vary across Bombana mining areas. Miners in Wumbubangka informed me that the price of a bottle of mercury, approximately 100 grams, was 3 million (3 *juta*) rupiahs (equal to approximately \$300 AUD based on the 2015 currency exchange rate). Women miners who carried out panning revealed that they can normally afford to buy a gram

of mercury at a cost of 40 thousand rupiahs (equal to \$4 AUD). Some women obtain one gram of mercury for free from gold buyers, but they have to sell their gold flakes back to them.

Conclusion

Despite the widespread use of mercury in the Bombana community since the gold rush in 2008, the issues of risks associated with mercury use in the community are not widely publicised. I believe that people have been ignorant (High, Kelly and Mair, 2012) of the health risks posed by using mercury. The ignorance of mercury implies that not merely the absence of knowledge about mercury (Hope, 2005, p. 76), but that scientific knowledge must compete with local forms of knowledge (Hobart, 1993, p. 1; Vitebsky, 1993, p. 101;20 Dilley, 2010, p. 177) that have developed in Bombana society. People in Bombana shared folk knowledge and local perceptions about mercury use, functions, side effects, and distribution.

Indeed, I argue that Bombana communities have developed both knowledge as well as ignorance around mercury issues due to several factors, including the convenience and benefits of using mercury, local cosmologies of mercury and its risks, and ambiguous interpretation of the laws regarding mercury influenced by culture, religion, and morality. Those factors are socially and culturally constructed according to Bombana local cultures. Another contributing factor is the lack of clear information, guidance about regulation and empowerment to miners, government officers and stakeholders.

People use their own terms for mercury, including *air raksa*, *air keras*, and *air perak*. The local terminology has influenced Bombana people to develop different perceptions, attitudes, beliefs, and behavioural responses to mercury and its potential hazards. Although *air raksa* and *merkuri* are the same substance, most Bombana people perceive *merkuri* as being more dangerous than *air raksa* according to their local cosmologies and knowledge. These various responses are also determined by people's knowledge, experiences, and contact with the material, cultural and religious values, upbringing, politics, and moral views (Douglas, 1966; Douglas and Wildavski, 1982; Douglas, 1992). I believe that the equivocal terms of local terminologies such as *air raksa*, *merkuri*, *air keras*, and *air perak* to describe mercury has likely contributed to how local people and miners perceive and downplay the risks of mercury. Those local mercury terminologies are more common for miners in Bombana as they have

²⁰ Pier Vitebsky (1993) follows Malinowski's work regarding the anthropology of ignorance.

adopted and exchanged skills, knowledge about mining activities during the gold rush when huge numbers of people swamped to the Rau-rau village from areas across Indonesia to mine in the village (see chapter 1).

Miners also ignore the risks of mercury because of the benefits they accrue from its use. Most local miners perceived *air raksa* as a useful chemical to bind gold, based on their knowledge and experience dealing with this substance for gold amalgamation. They mostly utilise mercury panning and *tromol* machines techniques. Although some mining techniques such as the sluice box, locally known as *kato*, used together with *dompeng* machines and *jet* machine—are known as mercury-free gold processing, at the end of those processes—the carpet washing processes (*cuci karpet*)—miners utilise mercury to maximise the gold results. Ignorance of the risks of mercury arises from a dynamic condition whereby Bombana miners struggle in the contest between their previous local knowledge of the advantages of mercury for mining activities on the one hand, and the new knowledge about mercury risks on the other. I argue that perceptions of the benefits of mercury have undermined the perception of its risks (Douglas & Wildavsky, 1982, p. 18).

In addition, mercury use has not been widely recognised as high-risk, and the dangers have not been integrated into local perceptions of risk among the Bombana people. This is probably because mercury is a new modern product that is not included in people's traditional cosmologies (Ellen and Soemarwoto, 2010). Very few people interviewed perceived mercury as a dangerous material that pollutes water and poses serious hidden risks for humans, other organisms, and the environment. There is also a serious lack of scientifically accepted information about mercury available in the community, particularly for the health professionals and the general Bombana community.

The local media, predominantly printed newspaper (*koran*), radio station (stasiun radio) and television have also played an important role in disseminating or not the information that mercury is dangerous and can pose negative health risks. Some people have access online media through internet on their phone to access the mining information. However, most local people—particularly miners, who are predominantly illiterate—do not have access to adequate information, resulting in an information gap about mercury. Moreover, the mass media has played a pivotal role in bringing the issues of mercury contamination into the public eye. The risks of mercury to human health in Bombana mining have been portrayed through the mass media. Take, for example, scientists from NGO Medicus Foundation and Bali Fokus (2015) and Price (2015) who depicted Dita's case through online media. They labelled Dita as a notable victim of mercury contamination and an officer told me that she set up a 'go fund me' website

and collected money to help Dita. However, health professionals who provided health services to Dita's family associated her illness not having had poliomyelitis immunisation. Meanwhile, local residents who live near Dita's house have their own local knowledge and have attributed Dita's illness to her father's sin, *karma*, *bala*, misfortune and transgression (Douglas & Wildavsky, 1982). It appears that not all insiders or local people have incorporated the risks of mercury into their traditional or local cosmologies as a health risk (Douglas, 1966; 1992; Ellen and Soemarwoto, 2010).

The risks of pollution, including the dangers of mercury contaminated water, have always been entangled with political issues, local laws (Douglas, 1966; 1992) and morality related to culture and religions. Political bodies, specifically local government, has played political games in mercury contamination issues within the frame of justice (Douglas, 1992, p. 22). Indeed, a community establishes their own pollution beliefs (Douglas & Wildavsky, 1982, p. 36) around mercury pollution and in this case Bombana community have constructed their own local wisdom around water pollution, mercury contamination on water and mercury toxicity.

It can also be argued that people construct ignorance around mercury and are unaware of the issues around mercury contamination because of the ambiguity of the laws and regulations related to the issues. Although the Indonesian government has established cross-institutional laws and regulations regarding mercury, there is still some ambiguity about the legal status of mercury in the community. In addition, the lack of information and negligent law enforcement have contributed to this ambiguity surrounding the status of mercury. Mercury laws also do not explicitly point to the end users (miners) as targets rather than distributors. Indeed, I argue that Islamic and cultural moralities also define the status of mercury as a *nonharam*, or a *non-forbidden* substance, according to local and religious values, which further contributes to the ambiguity of mercury's status. Given this ambiguity, people take a cautious approach by trading legal mercury 'under hand' or 'under the table', meaning black market.

Ultimately, I believe that the risks of mercury are still ignored and are considered to be hidden risks (Douglas & Wildavsky, 1982, p. 16) because mercury has not been seen as a significant health issue among the Bombana people. The next chapter will focus on women's lives in the Bombana mining areas.

Chapter Five

Tough Women ‘Wanita Perkasa’: Emancipation, Gender, and Health

On the afternoon of 4 October 2014, while sitting with Pak Desa and his wife Rosnia on the verandah of their uphill house, five women greeted us as they passed by. Rosnia identified them as local female miners returning home from the mining sites, as they did almost every day. Pak Desa called them *Ibu Suri Ce Es*,²¹ and he considered them 'tough women' (*wanita perkasa*) because they had taken on the role of panning and were seen in the paternalistic Rau-rau society as having deliberately moved out of their expected roles as housewives, which entail performing domestic duties.

This chapter explores the lives of these female miners or 'tough women'—housewives engaged in mining activities associated with mining across Rau-rau village and Bombana. My research mainly investigates how women have constructed their social lives, focusing on identity, emancipation, gender, and health issues in their domestic and public life. I have employed the anthropology of gender and feminist study to understand the array of women's modes of engagement in mining and the local perceptions and socio-culture-related identity construction, gender issues, and health risks women encountered in Bombana gold mining. I collected data from women in interviews and observations but also engaged a wide range of community members in discussions about women's roles in mining. I compared these with my own field observations.

In my study of gender, I analyse women's engagement in mining in gender terminology as socially constructed roles (Connell, 2012) instead of gender as a sex dichotomy of women and men (Oakley 1972, p. 9). I focus on socio-cultural factors combined with biological aspects which define gender in society (Atkinson and Errington, 1990). I agree with Robinson (2014, p. 107) that it would be more helpful to change the approach to the study of gender from analysing the position of women or status of women to the study of 'power relations, mapping gender orders as a 'historically constructed pattern of power relations between men and women including masculinity and femininity. This thesis refers to gender studies in Indonesian context

²¹ Ce Es stands for CS. This means a group and its members.

(Robinson, 1987; 1991; 2000; 202004; 2006; 2007; 2008; 2014; 2008; 2020; 2022; Robinson and Bessell, 2002).

In this chapter, I describe how women construct their identity in the village and the mining sites. In particular, I explain the identity production behind being 'tough women' (*wanita perkasa*). Then, I discuss women's engagement in various mining practices, emphasising sociocultural issues, economic, domestic, public life, and gender. I also analyse how women have formed the division of labour in mining. I examine women's political lives within the household and their social lives. I also assess their social reproduction/sexuality relationships through kinship, marriage, and adult relationships and consider the symbolism of maleness and femaleness. I explain changing patterns in marriage, infidelity, and divorce as products of mining activities. Thus, I illustrate the issues around masculinity and femininity by looking at body images and taboos. The final section describes women's health-related issues at mining sites, including physical health, reproductive health, and health services.

Being 'Tough Women': Identity and Emancipation

In the village, women were identified as as local women (*perempuan lokal*), migrant women (*perempuan pendatang*), or Moronene women (*bukan perempuan Moronene*), a term used interchangeably with indigenous Moronene women (*perempuan asli Moronene*). Women engaged in mining activity are female miners (*perempuan penambang*). Those women have their own ways of living and working in mining sites. I observed that both local and migrant women took on various roles in mining.

Most migrant women lived and settled with their families in mining camps located in remote areas on the outskirts of Rau-rau village. Because they did not reside in Rau-rau village, they were not formally counted as local women during the population census. In addition, those migrant women were highly mobile. They spent most of their time living in mining areas, ranging from approximately one week to one year, then moving on to another mining area or back to their hometowns.

Local women typically came and went from home to the mining sites daily. Local female miners who engaged in panning on the outskirts of their village were regarded as 'tough women' (*wanita perkasa*). Pak Desa assigned them this title because Rau-rau society still considers mining work rugged and masculine, dominated by male miners. When women entered the mining domain, they were socially constructed as 'tough women' (*wanita perkasa*).

The label of 'tough women' is a distinct identity, a particularly collective women's identity, which is different from women's self, the body of women, and women's individual identity (Sökefeld, 1999, p. 147; Erikson 1980, p. 109).



Figure 5.1 Informal group discussion with local female miners in Pak Desa's house

The term 'tough women' (*wanita perkasa*) is indicative of shared values and mutual relations that are constructed through sociocultural values embraced by the patriarchal Rau-rau community. The terminology is associated with judgment by a society that embraces patriarchal culture. In a patriarchal society, women are expected to carry substantial responsibilities, including looking after their families and performing domestic roles such as preparing food, managing money from their husbands, child-bearing, caring for their husbands, and washing (Uberoi, 1995). In the Bombana patriarchal cultures, women engage more in the domestic sphere than in public domains. Most of the women spend their time living, working, and serving in the house as housewives (*ibu rumah tangga*) and mothers (*ibu*). Those Bombana cultures have similarities with most Indonesian society cultures, 'locating Indonesian women as subordinate to men within the family and the state' (Robinson, 2000, p.139). Moreover, males dominate women in marriage because of the patriarchal culture within Indonesian

societies (Brenner, 2011). Bombana society's patriarchal culture has provided opportunities for men to dominate women in every sector of domestic and public life, including mining.

Domestic and Public Lives of Women Miners

During my research fieldwork, there were no accurate statistics or detailed information about the number of women participating in Bombana mining since 2008, when the gold rush began. The Bombana Bureau Statistics Agency (*Badan Pusat Statistik/BPS*) could not provide information about the number of local women engaged in mining. However, I estimated that approximately 10 percent of the miners working in Bombana were female. Moreover, around 15 percent of local women are engaged in mining activities, particularly panning. Only 10 percent of migrant women admitted their occupations as miners, including *marempel* and rat hole digging (*penggali lubang tikus*). And about 90 percent of those migrant women who live in the mining sites, identified as housewives (*Ibu Rumah tangga*) and stall vendors.

The women working in Bombana mining contribute to the total numbers of women working as miners across Indonesia. According to data from the Indonesian Mining Association and other organisations, women miners comprised approximately 10 percent (around 10,900 women) of the total 109,000 women working in artisanal and small-scale mining across Indonesia (Aspinal, 2001; Hentschel, 2003, p. 21). Women working in mining in other parts of Indonesia, such as Tatelu in North Sulawesi mining areas, performed a variety of work from processing gold ore, such as panning, to working as cooks (Aspinal, 2001, p. 14). Female miners in Bombana also juggled their mining roles, such as panning, with domestic duties, such as cooking. Furthermore, the presence of women in mining areas is significant for the mining communities.

In the sections below, I present the lives of local and migrant women engaged in various mining-related activities in the Bombana mining area. I also discuss various issues (political identity, economic, gender, psychological) in their working lives.

Sukmawati's Story: Viability of 'Dompeng Boss' and Economic Risk

Sukmawati was the only local indigenous Moronene woman who worked as a *dompeng* boss (*bos dompeng*), meaning someone owned the dompeng machine, in Lasangi hamlet, Rau-rau village. She was honoured as a successful woman (*wanita yang sukses*). She was divorced from a migrant Buginese miner and was the mother of a seven-year-old girl named Hikmah, so

she was often referred to by the teknonym, *Mama Hikmah* (Hikmah's mother). As a thriving local female entrepreneur, she was regarded as a role model for both male and local female villagers. Her beautiful modern brick house with a blue corrugated iron roof represents her success. Her house looks different from other houses in the village, which are mostly built from wood and bamboo.



Figure 5.2 Sukmawati and her employees in front of her brick house

Sukmawati declared that the desire to escape poverty—which she had lived with since she was in the womb—was her key to success. She was one of ten siblings in a low-income family, and her parents could hardly provide them with enough food or education, and she was lucky to finish primary schooling. She had initial contact with mining during the gold rush in 2008 when she panned and found 10 grams of gold. She and her previous miner husband used the money as capital to start their own business using a *dompeng* machine in 2011. At the end of the year, her husband returned to South Sulawesi province and then divorced her, leaving their child behind with her in Rau-rau village. Sukmawati as a single mother, continued their mining business alone.

Sukmawati expanded her mining business to an agriculture business. She bought a hand tractor and rented it out to villagers to maintain their paddy fields easily. She realised that the

income from mining was not promising. The hand tractor business gave her suitable profits to cover the mining business's maintenance fees and enhance the business. In 2012, while maintaining her hand tractor business, she bought another *dompeng* machine for mining. She continued running those two businesses simultaneously.

When I met Sukmawati in the PT. Tiran mining concession area, in Rau-rau village, she owned two *dompeng* machine units and employed six staff who were all family members, including her brother and brother-in-law. Sukmawati as a *dompeng* owner, operating in the gold mining company's concession area, was subject to the *mitra* system (Pidani, 2015). As the owner of the *dompeng* machine, she paid 30 per cent of her mining income to the mining company.

Sukmawati was more worried about the economic risks of her business, which she called '*resiko rugi*' (risk of loss)—including losing her machine in unattended remote mining areas—than risks to her health. However, she no longer needed to go into the muddy water and had limited contact with the mining areas. As the *dompeng* boss, she only needed to supervise her business and employees (with clean hands) when she visited the mining areas daily to wash carpets (*cuci karpet*) at around 3.00 pm.

Ibu Suri Group of 'Tough Women': Economic, Liberation and Health Issues

Ibu Suri was informally appointed as a team leader of Ibu Suri Cs, or Ibu Suri's group since she was the oldest woman in the group. Women in this group of miners were all Moslem, of indigenous Moronene descent, and identified themselves as residents of Rau-rau village. She and her family lived on the main road of Rau-rau village and mined in Block C, Tahi Ite hamlet. They worked daily in Sukmawati's mining area (see the previous section) or the *dompeng* area because most of them were her relatives and siblings.

Before going to the mining site, they would meet up at Ida's or other members' houses, eat lunch, and apply a thick mask called *bura* (*M*) onto their faces. They used *bura* (*M*) made from traditional herbs with rice flour as a sunblock to protect their faces. *Mabura* (*M*) is the action of applying the *bura* (*M*) onto the face.

Around midday, after *Dhuhr* prayer, they headed to the mining areas where the panning area was located. It took them approximately one hour to reach the location. They typically arrived at the location after washing carpets (*cuci karpet*). The *Ibu Suri Ce Es* travelled home to the village at around *Maghrib* prayer time, approximately 6.00 pm.

Washing carpets (*cuci karpet*) was the last process of the day for *dompeng* machine workers. After male miners used the *dompeng* machine to suck mud and sift it across a piece of carpet, they washed the carpet to sieve the gold, which was placed on a sluice box with water. The muddy water containing gold flecks remained in the *dompeng* hole (a drainage pond associated with *dompeng*, see section 5.3). When the carpet washing (*cuci karpet*) was finished, the women began panning in the *dompeng* hole. They used a small amount of mercury for panning that they kept in a small plastic tin. Most of them revealed that they used recycled mercury for panning because they could not afford to buy it new, which cost forty thousand rupiahs (approximately \$4 AUD) per drop or milligram.



Figure 5.3 Ibu Suri Cs engaged in panning

These women did not go to mine on Friday. Around 3.00–4.00 pm, the group gathered in Ibu Ida's backyard to play volleyball. Other villagers who wanted to play or meet friends would use this opportunity to join them. This event became important for entertainment and maintaining social relations amongst the villagers.

I decided to follow the Ibu Suri Cs to the mining site one day. The women agreed to meet in someone's house; then, they would walk together to the mining sites. At the time of my

visit, they gathered in Ida's house. Ida was an independent woman, panning to earn money for her family to support her husband and two children. Even though Ida knew that she was pregnant, she continued working until her fifth month. Ida revealed that she was a typical woman who had been hardworking and active since she was a young single girl.



Figure 5.4 Ibu Suri Cs and I just arrived at the mining site
(Photo credit to Omar Pidani)

I also met Hala, an old unmarried woman (*gadis tua*) who supported and cared for her paralysed mother and orphan niece. One of the other women was Arni, a widow with two children who was the breadwinner for her family. Darni and Erni were also aged around twenty years, and both married early with two young children each. They were hoping to earn cash to help sustain their families financially. Before heading to the mining sites, the women had lunch, prayed, applied the face mask, *mabura (M)*, and prepared their equipment. While waiting for their friends, they chatted, gossiped, smoked, and searched for lice in each other's hair.



Figure 5.5 Ibu Suri Cs and I heading back to the village at sunset. I observed that women always walked in a group when they returned home, carrying their equipment, such as shovels and frying pans; they always rushed to get home before *Maghrib* (prayer) time. (Photo credit to Omar Pidani)

On another occasion, I visited Ibu Suri, the leader of this group, the wife of the head of Lasangi hamlet of Rau-rau Village, and a mother of two children. Her husband was from South Konawe district and had chosen not to go mining because he thought it was hard, and he preferred raising cattle, goats, and chickens. Ibu Suri told me that she usually stopped panning during the paddy planting and harvesting seasons. She also considered herself a farmer (*petani*) rather than a miner (*penambang*) because she realised that she earned a more assured income from farming than from panning. She considered mining a side job that relied on luck and contributed only a tiny amount of money to the household income. She also engaged in mining for recreational purposes, entertainment, and socialising with her female peers. When I visited her on another day when her paddy plants were ready to be harvested, Ibu Suri informed me that she was struggling to maintain her family responsibilities, domestic duties, work in the paddy fields and engaging in mining. Consequently, she decided to cease her mining activities and concentrate on looking after her paddy field (*sawah*).



Figure 5.6 Ibu Suri heading to her paddy field located behind her wooden house

Ibu Suri Cs is a group of local indigenous female miners who pan for gold to raise some additional income for their families and to complement to their agricultural income. Their motivation for panning was not only financial but also in response to peer pressure and to enjoy social entertainment amidst their dull village life. Another reason was to become independent women who could enjoy their income from mining. They said they had not asked their husbands (*mintaminta sama suami*) for money or other things since they started earning money from panning. They enjoyed more freedom in how they could spend their money compared to the money received from their husbands. Although the local Moronene cultural norm stated that women have full authority to receive income from their husbands, they seemed proud to have their own income. This side income from mining empowered them to express themselves as independent women in the family and the community. The approval they received from Pak Desa as the leader, a man in the Moronene patriarchal society, reflects that those female miners are given more respect among the locals and possess more power, success, and independence.

On the negative side, most women in the Ibu Suri Cs group frequently experienced mining-related health issues. Some women complained of headaches and itchiness from contact with the muddy water contaminated by mercury from the carpet washing during panning. Most of them had experienced a land collapse in the mines. Arni had experienced a traumatic episode when she was drawn into muddy water as a consequence of a ground

collapse. She was fortunate to be alive: two male miners saved her. These women were more aware of the risks of land collapse than the severe risks of mercury, which they could not see (see Chapter Four).

Icah's Story: Trust Capital (*Modal Kepercayaan*) and Fecundity

Icah was the most successful female migrant who lived in a beautiful, sophisticated, two-storey combined house and shop (*rumah toko/ruko*) at the junction of three villages: Rau-rau village, Poleang district, and Tahi Ite hamlet.

In 2010, when she was single, Icah came to Rau-rau village from Wajo, Southeast Sulawesi province, with her sister. They settled in the Polodu mining settlement to find *rezeki*, hoping for a better life by panning for gold. When she had made enough money from panning, she decided to buy and sell gold. She called this a process of circulating her money (*putar uang*). With her small initial capital (*modal awal*), she built her small stall at the junction of Rau-rau and became a gold buyer (*pembeli emas*).

Icah admitted that she did not have much money to grow her business and only had the trust capital (*modal kepercayaan*) from a Bugis investor (*pemodal*). The investor loaned her some money to buy gold, and then she sold it and earned interest from it. She kept the 'trust capital' very tight by returning money on time with some high interest to those investors. If they loaned their money, the investors reaped more benefits (*untung*) from Icah than others. The news about Icah's good achievement spurred many more Bugis investors to offer Icah more money to grow her gold business. She said, 'Although I had limited money to grow my gold business, the investors (*pemodal*) who come from the same ethnic background (*suku*), which is Buginese, trusted me to borrow and grow their money into my business. The best asset I ever had was their trust (*kepercayaan*).'

When she learned that gold mining was not very promising, she expanded her business from gold buying to opening a mini-market where she sold groceries (*sembako*) and mining equipment, such as spare parts for *dompeng* machines.

She married a Buginese migrant who also works to support her businesses. She and her husband are worried because they have not yet had any descendants (*keturunan*) in their six years of marriage, meaning children. There is a chance her infertile condition is related to the fact that she and her husband have been burning amalgam in their house for years in a closed room to produce gold. I believe this may have contributed to Icah's infertility.

Rowland, Baird, Weinberg, Shore, Shy and Wilcox (1995) argue that exposure to mercury vapour or inorganic mercury compounds will have negative impacts on women's fertility, while low-exposure women are more fertile.



Figure 5.7 Icah's combined house and store called *Rumah Toko/Ruko*

Female Migrant Miners: *Marempel (M)*, Dependence and Childrearing

At the Padambila mining site, I met Dian, a Bugis female migrant living in the Padambila blue tent mining settlement with her Moronene migrant husband and three children. She managed to look after her children, cook, wash, and participate in social life with other women while carrying out *marempel* activities under her stilt hut. *Marempel (M)* is a process of crushing rocks into fine materials, drying the wet crushed rocks on a hot sunny day, sifting the crushed rocks with a hand sieve, and then resifting the material, making it ready for panning. Dian is a typical migrant woman who engaged in mining while looking after her family.



Figure 5.8 Migrant women carrying out *marempel* while looking after their children



Figure 5.9 Female migrants working as stall vendors and some doing *marempel*



Figure 5.10 A female miner carrying gold material on her head to the *tromol* machine

Dian had some female neighbours, including women who were single, widows/divorcees, or housewives living with spouses. Her female neighbours mostly worked as stall vendors (*penjaga warung*). Most were also involved in mining activities, such as *marempel*, collecting and transporting gold materials to *dompeng* machine, and panning. One of them was Ibu Nur, a Javanese migrant from another village in Bombana. She owned a food stall (*rumah makan*) where mostly male customers came to relax after mining, drinking coffee and chatting. She is sometimes joined by Nia to prepare ingredients for cooking. She said that the local villagers regarded all women who lived in the blue tent mining settlement, whether they actively mined gold or not, as miners.

Due to cultural values, Dian and other migrant women who had accompanied their families were highly dependent on their husbands. Dian revealed that she could not go anywhere she wanted and leave the mining sites without an escort from family members, and her husband had the authority to allow or stop her from mining.



Figure 5.11 A female migrant mother juggling her panning activity with caring for her child

While working as miners, Dian and other female migrant mines carried out many parental responsibilities, such as childbearing, child-caring and child-rearing. In block C Tahi Ite, I met

a mother with her five-year-old daughter. The mother told me that she brought her child to panning because she had no one to look after her, and she needed to earn additional income for her family. Her daughter played in the muddy, water contaminated with mercury while panning and conversing with other miners. When her child was shivering, she took her out of the water and sat on the sunny ground. She asked her child to stay in the sunny area to keep warm. The child continued playing in the sunshine, and her mother returned to the hole to continue panning. This mother did not think about the risks she exposed her child to, such as mercury contamination and sunburn. The mother was only concerned that her child did not fall into a muddy puddle or get buried under collapsed ground.

Division of Labour and Economic Organisation

Both local and migrant women have equally contributed to the variety of division of labour in Bombana mining. However, local Moronene women have more mobility and autonomy to engage in mining activity (See Ibu Suri Cs story) than migrant women (see Dian story).

Both local and migrant women have contributed to the dynamic economic situation in Bombana mining. Those limited numbers of women engaged in mining-related activities dared to undertake jobs in the top positions, which generated the most significant economic benefits, such as running a business. Those women preferred to set up and manage their own businesses (see Sukmawati, the *dompeng* boss story and Icah story). They managed to raise small initial capital to expand into mining goods, building and land assets that subsequently brought them to become a boss, which is acknowledged as the top position in mining. Being a 'boss' meant those women had to invest in substantial capital items, such as expensive *dompeng* machines, but they also did fewer physical jobs.

Both local and migrant women without much money or capital do panning, which is regarded as a lower position in Bombana mining society. Those women chose to work as independent workers, for instance Ibu Suri Cs a group of local women miners who did panning, and also Dian, a migrant miner who carried out *marempel*—or crushing rocks—during childbearing and child-rearing. If they did pan, this required less economic capital, such as a pan and shovel, and was less physically demanding compared to other mining jobs.

I will compare women's and men's labour engagements in informal economic mining activities. This perception of a division of labour exists because males still dominate labour activities at Bombana mining sites. Most male miners preferred hard physical work—such as *pendompeng* work—that requires extra energy, whilst most women carefully chose less physically demanding activities in mining. Women usually selected managerial roles, such as being a *dompeng* boss, or pursuing panning jobs. Those types of labour do not require substantial physical commitment. Women involved in digging activities are scarce, and almost no women are engaged in *dompeng* activities, while males mastered these more physically challenging mining activities, such as shafts/'rat holes' diggers (*penggali lubang tikus*). Both women and men acknowledged that most mining activities, such as *pendompeng* and shaft digging, are male jobs. Men also earned more money than women.

Women have experienced discrimination compared to men in their shift times in their engagement as miners. Women are only able to work during the day, while men can work both day and night. I observed on mining sites that all women stopped working at the *Maghreb* prayer times around 6.00 pm, whereas some men were allowed to work late into the night. Society restricts women from mining sites at nighttime because this carries the stigma of evil women associated with prostitution. In Bombana society, prostitutes were termed as night butterflies (*kupu-kupu malam*) who primarily worked at night.

In formal mining companies, employment is still dominated by men. Women are not officially employed as miners, and are mostly hired for domestic positions like cooks and administrative officers. Andi, the manager of PT. Tiran, based in Rau-rau, informed me that the decision not to employ women was because of their physical constraints. The company recruited only men as supervisors (*pengawas*) and geologists because they could survive in the harsh geographic conditions and insecure mining areas.

Marriage, Infidelity, and Divorce Due to Mining

Mining activities in the Bombana district have encouraged cross-cultural marriages and fostered infidelity and divorce in the community. The Bombana Bureau of Statistics could not provide the exact number of cross-cultural marriages between locals and migrants (*Badan Pusat Statistik Bombana/BPS Bombana, 2011*). However, I believe that the numbers have increased since the gold rush and the subsequent population increase in Rau-rau village since

the last census in 2011 (*BPS Bombana*, 2011) (see chapter one). According to my observations and information from Pak Desa, many male migrants from Southeast Sulawesi and Borneo have married local Moronene women. Some migrant male miners who married local females lived in the villages with their wives, while some took their wives to their hometowns. In rare cases, migrant female miners married local males and lived in the local villages.

In general, mixed marriage spouses have embraced the mixed cultural dynamic patterns in their spouse roles and relations. Although males and females in mixed marriages still retained their cultural upbringing, they seemed to assimilate well with local Moronene culture in their everyday lives (see the story of Tina and Andi). Idrus's (2003) noted this phenomenon in her thesis about the marriage of the Bugis; and that the local culture determines the dynamics of marital life in a society. Migrant couples also experienced dynamic shifts of power in their relationship, such as female domination in decision-making when females are engaged in mining and vice versa. This dynamic relation is related to the argument of Robinson (1996) that members of mining communities experience dynamic power relations in their marital lives.

Mila's Story: Marriage and Life Sacrifice

Mila was a local woman of Moronene descent and the youngest (*anak bungsu*) of ten siblings in the family. Her mother was very protective of her and always wanted Mila to stay with her. It is typical in Moronene culture for the youngest to stay and look after the parents in the family.

Mila met Nurdin, a male miner from the Kolaka district, Southeast Sulawesi province, during the gold rush in 2009. This romantic relationship blossomed into marriage in 2010. This happy couple lives in the Rau-rau village in Mila's mother's house because all Mila's siblings have moved to their own houses. At the beginning of their marriage, Nurdin worked as a miner and joined some *dompeng* machine teams. Mila sometimes joined other local women in the village to undertake panning to help her family's finances.

In 2011, when the quantity of gold decreased, Mila's husband decided to move back to his hometown of Kolaka city. However, Mila's mother did not want Mila to move with her husband, even though she knew her daughter was pregnant. Her husband threatened to divorce her, so Mila decided to follow her husband to his Kolaka home. The situation worsened when she became sick after delivering a baby girl, and there was no one to help her with household duties. Her husband abandoned her and was busy with his business outside the town. When her

condition became more severe, her mother and two siblings decided to take her and the baby back to Rau-rau village. She fretted about her husband, who refused to visit her and the child, and became stressed and refused food. A month after she and her baby girl joined her mother, Mila passed away due to an unknown disease.

Heni's Story: Infidelity, Divorce and Women's Empowerment

Heni is a local Moronene girl who married Hasan, an older local Moronene male. They had both been involved in panning activities. However, Hasan no longer engaged in mining because of a hernia and spent most of his time at home. He started raising goats and chickens under their stilt house. Heni continued to mine to 'keep the smoke rising in their kitchen' (*menjaga dapur tetap berasap*) and earn money to support their family life. She was considered the primary breadwinner in their new family, albeit without children to support. She spent most of her first year at the mining sites without her husband at her side, and gossip indicated she was having a relationship with a migrant mining companion. She maintained her unfaithful behaviour for two years and then divorced her husband. People in the Rau-rau village said that she was much stronger economically and personally than her husband. Her husband lacked power because he was sick. She divorced Hasan, married the migrant miner she had an affair with, and moved with her new husband to his district of origin.

This story illustrates the case of a woman who held the status of a miner, was associated with economic dependence, and developed the power to cheat on and divorce her husband. In this case, gaining economic power and independence empowered the woman (Robinson, 1986). As this case suggests, the miner status, when attached to women, will positively encourage and empower them to navigate their marital lives, and this may include infidelity and divorce.

Tina and Andi's Story: Gold Rush Couple and a Happy Marriage

When I stopped to buy durian fruits on the road from Bombana to Kendari, I met a couple with a young child (a four-year-old girl) who was expecting their second baby. Tina and Andi had come to Bombana in 2009 when the gold rush commenced. Tina, a Tolakinese girl, was a divorcee from South Konawe, and Andi came from Manado, North Sulawesi. Tina

was panning while Andi joined a *dompeng* group from Gorontalo and Manado. Tina shared a tent with four females next to the tent where Andi lived with his six friends. They frequently met around the mining area, which allowed them to develop love and companionship. In 2010, they decided to stop mining and married according to Tolaki cultural marriage customs in Tina's hometown in South Konawe district. Tolaki is a significant ethnic community in Konawe districts and Kendari municipality located in the mainland of Southeast Sulawesi. The couple decided to use money saved from mining as initial capital to buy a small area of rice fields and land. Andi helped Tina's father work in their paddy field, and they pursued their destiny of trading fruits and other goods.

Their story is typical of migrant couples who started their romance in the mining areas and married. The couple decided to seek alternative livelihoods by moving to the bride's hometown and replacing mining with agricultural activities and trading. These strategies can also work to sustain their married life. Mining provides some startup capital for couples to start a life as a new family.



Figure 5.12 Tina and Andi with their daughter in front of their durian stall

Masculine and Feminine: Body Images and Taboo

Masculinity and femininity constitute a two-sided coin in the power relations between men and women. Margaret Mead (1935) conducted an early study of femininity and masculinity, which found disparities in gender among the New Guinea cultures of Arapesh, Mundugumor, and Tchambuli. She argued that the feminine temperament—nurturing, maternal, and passive qualities—and the masculine temperament do not reflect biological differences (Mead, 1935). Masculinity and femininity are socially constructed and vary across cultures (Ferraro and Andreatta, 2017, p. 256).

Gender categories in Rau-rau society comprise male, female, *bencong/banci* (males who exhibit feminine behaviour, such as speaking like a female or wearing makeup and lipstick) and *lesbian/lesbi* (females who exhibit masculine behaviour, such as dressing like males with short haircuts and being sexually aroused by women). Additionally, most lesbians have been termed *tomboy* (someone who exhibits a masculine temperament).

Mabura (M): Keeping Femininity in Masculine Mining Areas

Women in Bombana mining areas have a particular way of presenting themselves in the mining sites (see *mabura (M)* and *bertato*). To maintain their femininity in masculine mining areas, most female miners do *mabura (M)*, put on the rice flour face mask (*bura*), when they go to the mine (see Ibu Suri's Cs story).

According to Nikmah—one of the *dompeng* machine owners in Wumbubangka village—most Moronene women do not want to mine as they do not want to get sunburnt or tanned by the sun. They are regarded as more beautiful if they have light-coloured skin. Therefore, they wear *mabura (M)* to maintain light skin. Women also wear protective clothing such as long-sleeved clothes, and some wear a sarong to cover their heads to protect them from mosquito bites and sun exposure. They also wear wrapped sarongs to protect their heads from the rough materials they must carry from the *dompeng* sites to the *trommol* machine sites.



Figure 5.13 A female miner with her *bura* on or *mabura* (M)

God Blesses Tattooing People: Body Images and Masculinity

In Bombana mining, men have presented themselves by wearing tattoos on parts of their bodies such as arms, legs, and hands. Males wear tattoos to exhibit their masculinity and maleness. I observed that the only people with tattoos on their arms were men and not women. Most men have tattoos, although some do not want any. A motto was printed on an old man's red singlet stating that "*Tuhan memberkati orang-orang bertattoo*", which means "God blesses people who have tattoos (on their bodies)". Miners perceived tattoos on male miners' bodies as usual and would not be controversial among men in mining sites. Some men revealed that tattoos make them feel more robust and more macho. From the villagers' perspective, people with tattoos living in mining sites are considered brave. Some males tattoo themselves, some asked their friends to tattoo them, and others paid for them.



Figure 5.14. Male miners expressed their masculinity and self-representation through their bodies via tattoos



Figure 5.15 My supervisor Kathy Robinson among the tattooed migrant male miners at Padambila mining site

However, some villagers secretly told me they thought most tattooed people were ex-prisoners appointed to guard the mining sites. They also stigmatised them as bad people who consistently engaged in criminal activities such as violence or theft. In addition, most men displayed their masculinity through their clothing or lack thereof, by wearing a singlet and Hawaiian pants or simply mining without a top, which they felt was for flexibility and weather reasons. One of the miners joked that he wanted to show off his six-pack body that most men dream of.

'No Young Women in Mining Sites': Taboos and Gender Inequality

At mining sites, gender inequality and taboos or *pemali/pamali* (see Chapter Six on moral risk) related to female engagement in mining activities are interconnected. I experienced a case of gender inequality linked with taboo when I visited a female Buginese *dompeng* boss named Ibu Haji (the word *haji* came from the word *hajj*). People called her Ibu Haji because she had performed *hajj* pilgrimage. She was approximately fifty, and the community considered her to be of mature age. She was the boss and the only female among seven males in a group of *dompeng* workers who mined in the PT Dynasty mining concession. When supervising her seven young male workers of Buginese and Javanese descent, Ibu Haji stayed in the blue tent. I asked her whether she had any females working for her. She replied, 'Yes, I had one female worker, but she was a *tomboy*. Her haircut was like a man's. She also did not like to wear a skirt but jeans and a shirt. She did not use the hose to spray water on the ground and mix it with the potential gold material. Male miners did not allow the *tomboy* lady to do heavy work but only light jobs, such as picking up rocks (*pungut-pungut batu*) and separating them from the materials. The Bombana mining society considers *tomboy* as females and expects females to do light mining jobs.

Bombana mining society perceives it taboo for young women to stay at mining sites. One of Bu Haji's staff informed me that Bu Haji was the only woman allowed to stay in the tent because she was considered an old lady. They believed that the presence of young women was taboo (*pemali/pamali*) because they would chase the gold away. No wonder when I visited Ibu Haji in her tent, her staff laughed, and one of them told me, 'You are not supposed to come here because you are still a young lady. The worker did not permit me to touch the gold he had found the day before. They considered me a young female that might cause the jinn to hide the gold from them.

It is also seriously taboo for women who are menstruating to enter mining sites. The condition of women during their menstruation period is stigmatised, and menstrual taboos are found in other parts of Indonesia. Pedersen (2002) noted that menstruation demoted women's status in Bali to a lower position; for example, women had to undertake purification rituals if their monthly period coincided with the ritual times. In another culture, the Desana, it is believed that menstrual odour is a signal of women's dangerous ability to undermine the structure of society (Classen, 1992). Menstruation is also seen as a curse for some women because it is evidence they failed to conceive (Van de Walle and Renne, 2001). Lahiri-Dutt & Robinson (2008) noted that there was period problems related to gender inequalities in coal mining industries.

There were many taboos that prevented women from engaging in mining during menstruation (*masa haid*). Bombana people and miners believed that if menstruating women enter the mining sites, everybody is exposed to the risk of *bala* or bad luck (*sial*) in many forms such as tunnel collapse, the gold disappearing or decreasing in quantity, hidden by *jinn*. If that happened, they were required to conduct traditional purification rituals such as *mewusoi*, or *baca-baca* (see Chapter 2 about traditional rituals for the details).



Figure 5.16 I visited Ibu Haji and her employees in their tent

Women's Health: Physical, Reproductive, and Health Services

Physical health issues are a concern for women in the village. Drawing from the results of my group discussions and formal and informal conversations with women miners across the village, women revealed that they are concerned about severe physical risks such as land collapses (*tanah runtuh*). Although men and women miners in mining experienced the issues of the tunnel collapse, women expressed more concern than men. Some residents said that most deaths resulted from land collapses. This information was consistent with news in a local newspaper (Kompas.com, 2008b) in Southeast Sulawesi, reporting nine women died from tunnel collapse accidents in Bombana. The total number of accidents was 39 miners (Kompas.com, 2008b). Ibu Suri, who had experienced a land collapse, told me that her strategies to prevent dangers such as land collapse included proceeding to mining sites as a group instead of going alone. Working in a group allows them to share responsibility for assessing delicate land areas that can collapse. In addition, if they have an accident, friends can help them quickly.

Some women also mentioned experiencing physical health issues and symptoms such as itchiness (*gatal-gatal*), headaches (*sakit kepala*) and fainting (*pusing*), which they regarded as resulting from their panning activities (which sometimes bothered them daily). Those illnesses mostly appeared after they went panning and had immersed their bodies in muddy water for hours.

Cases of injuries resulting from domestic violence were also prominent at mining sites. Sukma, the Rau-rau village nurse, told me that she dealt with many cases of domestic violence in the village. She remembered the case of a migrant woman (potentially a prostitute) from one of the mining settlements coming to her clinic with injuries due to domestic violence. A male (potentially the woman's customer) had cut her with a long machete, leaving a bleeding wound on her forehead. The woman refused to get a referral to the Bombana local hospital because she feared being arrested by the local police. She chose to go to a distant community health service to get medical treatment. Health centres are located outside the administrative areas of the Rarowatu sub-district, including Rau-rau village, such as Poleang sub-district and other nearby district areas, such as Kolaka and South Konawe. The nurse suspected she was one of the sex workers not permitted to operate at mining sites. The police categorised prostitution as

an illegal and social problem (see Chapter Two on social illness and Chapter Seven on police prosecution of social illness).

Reproductive health issues related to working at mining sites while pregnant were also common among female miners. Pregnancies do not deter some women from participating in mining activities. One of them was Ida (see Ibu Suri Cs story). My first visit to her house was when she was in her twelfth week of pregnancy. She knew she was pregnant, yet she continued her mining activities, walking around five kilometres per day for six days a week. She said, 'Instead of just sitting and staying at home, I had better go to mine. I used to work hard before, so it is unimportant [whether] I am pregnant.' I met up with Ida again at her neighbour's house when she was 23 weeks pregnant. She told me she could not travel to the mine anymore as she was getting bigger, which made her feel heavy and tired. However, she kept herself busy by looking after her paddy field. Six months later, when I returned to Rau-rau village for my second research trip, I visited Ida and her baby girl. She and her baby were healthy and happy.



Figure 5.17 Ida (woman in green hijab/scarf), who was five months pregnant, getting ready for panning

Ida perceived her third pregnancy as a natural event and not different from her everyday life when not pregnant, and therefore, she continued panning with the Ibu Suri Cs group every

week. Lazarus (1994, p. 25) noted some women in society have the power to control pregnancy and childbirth. Ida also expressed confidence in exercising the same control as her husband over her pregnancy and childbirth. She was unconcerned about her or her infant's health while working in mining until she felt insecure and had trouble walking during her seventh month of pregnancy. Then, she decided to stop her panning activities and stayed home resting, preparing for her delivery time, and looking after her children and her husband.

Most people I met in Bombana mining raised concerns about the availability of reproductive health services—including health facilities and providers, or health professionals, including midwives and nurses. When I visited the mining settlements, most female migrants complained about the difficulties of finding medical services, particularly for pregnant women to find services for themselves and their infants. This encouraged most pregnant women to visit the traditional birth attendants in the village to help them with deliveries. They found that the traditional birth attendants' services were more affordable. They only paid around a hundred thousand rupiahs per delivery and could pay in instalments before delivery, locally dubbed *utang dulu* (pre-debt), compared to the hospital.

The difficulty of contacting and obtaining health services from the village midwives at mining sites motivated Sarti to pretend to be a professional midwife. She convinced miners in remote mining areas such as Padambila and Roko-roko that she was a trained midwife who could help deliver their babies. However, people discovered that she did not have any qualifications and was not a traditional birth attendant. The factor that motivated her to lie was money. Once people learned the truth, she was forced to stop her practice, and she could no longer continue her scam.

The challenging conditions—such as the remoteness of the mining areas, poor transportation facilities, and the complex, rocky, and muddy road conditions to reach the mining areas—discouraged health professionals such as midwives from providing reproductive health services for migrant female miners. Ros, one of the village midwives, said that the challenging geographical conditions had forced her to reduce her visits to the mining sites. She had a fall and incurred spinal injuries from a motorcycle accident, which generated continuous pain and affected her daily activities. Anti, another village midwife, stated that she could not reach the mining settlements because of the poor conditions of the roads.

The illegal status of mining sites was another reason for the poor provision of health services and facilities, including those for women and children, in the remote mining settlements. Mirna, a Palopo migrant woman who lives with her husband and children, wondered why the Bombana government did not provide health posts (*posyandu*) for people at

remote mining sites. When I followed through with this issue, a Bombana government official argued that the government did not build health facilities in mining settlements deemed illegal according to mining law. The illegal status made it ethically tricky for the government to build health services for the miners. Miners in those illegal settlements are expected to access the nearby integrated health post (*Pos Pelayanan terpadu/Posyandu*) located in Tahi Ite hamlet or the community health service (*Puskesmas*) in Taubonto.

However, poor transportation and infrastructure hindered those miners accessing these official health service facilities. The closest *Posyandu* (women and children's health clinic) was located in the main Rau-rau village, which was around a half-hour trip by motorcycle in dry road conditions but it could take one hour in muddy, rainy conditions or during the wet season. They were also expected to access the *Puskesmas* (government-sponsored rural health facility) for Rarowatu sub-district villages, located in Taubonto village, approximately 60 minutes by motorcycle from the mining sites. In Rau-rau the *Posyandu*, operated once a month, with three health professionals in attendance—two midwives and one nurse—who were appointed to provide health services to Rau-rau residents, including migrant miners. The *posyandu* only provides reproductive health and children health services, including antenatal care, post-natal care and child development monitoring.

Women in Bombana gold mining areas (see chapter four on mercury) were ignored of the risks associated with mercury used for gold amalgamation in panning and *trommol* machines. Most women I met in the mining areas—including Ibu Suri Cs, who were frequently exposed to mercury during their panning activities—revealed that they did not understand about the risks of mercury to their bodies. Based on their experience and information, mercury—locally called *air raksa*, *air keras*, and *air perak*—was an effective chemical for binding gold and separate it from fine sand materials (see chapter four). This ignorance has influenced their perception of the advantages of mercury that outweighed their perceptions of the risks of mercury. Consequently, they ignored mercury risks because they had no knowledge or little acquired information.



Figure 5.18 Women wait for the remnants whilst men keep the rich gold materials

Conclusion

Bombana society constructs women identity as two dichotomies *perempuan asli* (local women) vs *perempuan pendatang* (migrant women) and *perempuan penambang* (women miners) vs *ibu rumah tangga* (housewife). Women who live in the patriarchal Bombana community encountered stigma as individuals who are expected as housewife (*ibu rumah tangga*) to stay home to manage their domestic roles such as childbearing, child caring, and cooking. When the women become female miners, they are considered extraordinary women. For example, Ibu Suri Cs, are a group of local *perempuan penambang* (women miners) whose identity has been constructed as '*wanita perkasa*' (tough women).

The identity of *wanita perkasa* is strongly related to gender equality in mining. The construction of '*perempuan perkasa*' tough women' identity shows that gold mining has opened opportunities for women to be more liberated in this patriarchal society. Mining has allowed women to gain more freedom and power to express themselves as individuals in their lives. The label of tough women attached to female miners symbolises empowerment and is evidence that mining activities can enhance the status of women in the Bombana society. The 'tough' (*perkasa*) implied strong (*kuat*) label of women also symbolises those women have gained more economic autonomy, mobility (physical autonomy), and a more varied social life. The terminology of 'tough women' (*wanita perkasa*) is also associated with 'Kartini', the symbol of Indonesian women's 'social participation, challenges, and achievements' (Robinson, 2020, p.139 cited in Biji, Grace and Chin, 2020). Indeed, the term 'tough women' (*wanita perkasa*) relates to women's emancipation and empowered identity. Women in Bombana mining have

followed the steps of other Indonesian women in mining, who are more liberated to negotiate their power relations in various activities in mining sectors.

Women's experiences in Bombana mining sites exhibit a similar pattern to that found in other areas worldwide where women are engaged in mining as labourers and providing services and goods to miners (Hinton et al., 2003; Yokofleva, 2007). Both local and migrant women participate directly and indirectly in many mining activities. However, most women have chosen to juggle mining activities with their domestic duties, such as child-bearing and child-rearing activities.

Women are directly engaged in mining as labourers. They perform panning; *marempel* (crushing stones); act as bosses of *dompeng* machine groups; work as *dompeng* group staff; own mining land; supervise small-scale mining companies and their miners; cook for *dompeng* mining groups; operate *trommol* machines and work as rat shaft diggers (*penggali lubang tikus*).

Some women are also indirectly involved in mining activities, including economic and non-economic activities around mining sites. Female migrants primarily engage in mining activities and provide mining services for instance, working as stall vendors (*penjual sembako*) or mobile stall vendors (*pedagang kelontong keliling*), gold buyers (*pembeli emas*), and beauticians. Some women also secretly provide services as prostitutes. Most local women mainly participate in agricultural activities as farmers and also pull logs from the jungle (*penarik kayu*).

When women decide to embrace public life and become miners, they hold more autonomy, independence, and flexibility in voicing their needs to their male counterparts. For example, Sukmawati, who had more autonomy to build mining business with her husband, expanded her business when he left her. Involvement in mining activities has allowed women to acquire more authority to make decisions about their marital status, infidelity and divorce (See Heni and Icah stories). Robinson (2009; 2014) noted that women miners also exercised power relations in adult cathexis related to family formation and its dynamics, such as marriage, infidelity, and divorce.

However, female miners also encountered issues in relation to the expression of masculinity and femininity through symbols. Both women and men share the same power to express themselves through body image. Women exhibit themselves following the norm of femininity by covering up their heads and bodies using fabrics and makeup. Men exhibit masculinity by wearing tattoos on some parts of their bodies—such as their upper arms, legs,

shoulders, and hands—and exposing parts of their body. Women have encountered gender inequality regarding taboos (*pamali/pemali*) against activities in mining.

Like other mining sites in Indonesia (Macintyre, 2006; Robinson, 2009) Bombana's patriarchal society sees mining as a masculine sector. The male-dominated work in mining is associated with hard labour, muddy and dirty clothes, digging, etc., and constant sun exposure. Bombana society expects women to always maintain their femininity. I recall Mama Aldi, a female boss miner, telling me that the Bombana and the Moronene consider women beautiful if they have white skin (*kulit putih*), which means those women typically have bright and smooth skin and wear clean clothes. Therefore, many local Moronene women did not want to engage in mining activities. However, when they saw Mama Aldi owned two cars and a beautiful, sophisticated brick house, they changed their values and began to mine. Women miners in Bombana mining found ways to keep their femininity in masculine mining areas by applying a rice flour mask to their faces, called *mabura* (*M*).

Ultimately, however, the labour and economic organisation at mining sites remain dominated by men. Although women have the authority to engage in any mining activity requiring less physical exertion, they also encounter gender discrimination in the formal mining sectors, such as in the jobs offered by some mining companies. They are discriminated against according to the values of the patriarchal cultures that associate women with weak physical states. However, women also took advantage of this gendered situation. They tended to choose low-risk jobs, while men chose high-risk jobs. More men than women dug shafts in the rat hole and the excavator mining sites. When I observed miners in Padambila excavating mining sites, most women workers were only sitting near the holes while the men undertook shaft digging. A woman said, 'We are just waiting to queue for the remnant (gold) materials'. Another added: 'We take only the remnants while males take the rich gold vein materials'. Women excuse themselves from engaging in heavy mining activities for biological reasons. They consider themselves biologically weaker, influencing them to pan over digging shafts.

Women who engage in Bombana mining activities encounter health issues at the mining sites related to physical health, reproductive health, and access to health services. Health issues and sociocultural and gender issues are interconnected. Bombana female miners are concerned about various physical health risks related to land collapses, death, skin diseases and skin burns. In addition, they encounter reproductive health issues related to the lack of health services—including health professionals and health facilities. Furthermore, women also ignore the risks of mercury (*air raksa* or *merkuri*) because they lack knowledge about the risks. Their traditional knowledge recognises air raksa (mercury) as a safe chemical. My findings differ

slightly from those of Lynas (2015), who found that health issues among female miners in Papua New Guinea were predominantly issues of physical health, reproductive health, and safety. The World Health Organisation (2002) noted that one of the reasons women and girls are more likely to encounter health disadvantages than men is because of biological and gender-related differences and the discrimination embedded in sociocultural factors associated with gender relations.

The health status of women at Bombana mining sites is not a simple phenomenon that can be measured using the health indicator indexes, such as maternal mortality rate, infant mortality rate, incidence rates, or other disease indexes. Given the very complex condition of health issues in Bombana, I agree with the World Health Organisation (2019) recommendation to examine the comprehensive determinants of human health and women's health, including social and economic factors, the physical environment, a person's characteristics and behaviours, and additional factors such as income and social status, education, climate, social support networks, genetics, health services, and gender. I also follow Hinton et al. (2003) advice to examine various factors such as working and living conditions, social environment and culture which also determine the health and well-being of women in mining. In addition, health programs at mining sites need to consider reproductive health, physical health, and safety issues (Lynas, 2015). In this context, the Bombana government, particularly the Bombana Health Department (*Dinas Kesehatan Bombana*), can lead the sector by measuring comprehensive health indicators and providing health promotion and intervention programs involving all Bombana society stakeholders. Such programs should incorporate Bombana socio-cultural factors. For instance, the health programs should contain Moronene local culture and the use of Moronene language to educate women about mercury risks.

These health issues, predominantly reproductive health issues, carry subsequent consequences for Bombana people, particularly children in society. In the next chapter, I will explore the presence and involvement of children at mining sites.

Chapter Six

Children Play and Work in Mining Sites: Filial Piety, Risks, and Education

As I arrived at Roko-roko mining settlement on 5 November 2014, I spotted a woman rotating a bamboo winch on top of a rat hole (*lubang tikus*). As I looked into the hole, a small head appeared. It was Ahmad, an eight-year-old boy, in a baggy blue top and black short pants, wearing a head torch attached to his forehead. He was tied to a rope about one centimeter in diameter, and holding a yellow sack of gold. The woman, whom I later learned was his mother, approached him, took the sack, helped him untie the rope, and moved the yellow sack toward the winch. Ahmad approached a two-year-old girl sitting on the ground near the rat hole with other children. He picked her up, kissed her on the left cheek, and placed her on his lap. Ahmad and his sister were happily laughing and conversing in a language that I did not understand.

This chapter analyses the presence of Ahmad and other children at the Bombana mining sites from the perspectives of childhood anthropology (Mead, 1928; Malinowski, 1930; Mead, 1932; 1946; Hardman, 1973; Schwartzman, 2001; Hart, 2006; LeVine 2007; Bluebond-Langner & Korbin, 2007; Montgomery, 2009; Vitale, 2014; Lancy, 2015). I also analyse the presence of children in Bombana mining sites from eco-cultural perspectives (LeVine 2007; Weisner, 2002) concentrating on ecological and institutional factors that impinge on the daily lives of families, and their influences on children's development and parents' psycho-cultural circumstances (Weisner, 2002, p. 277).

In studies of children's socio-cultural development in the social sciences and environmental science, the topic of children in mining sites has been given special attention, particularly the issues of child labour and exposure to mercury. Child labour issues still dominate studies of children in mining (Henne & Moseley, 2005; Hilson, 2008, 2010; 2012; Webbink, Smits & De Jong, 2012). Other scholars (Harada, Akagi, Tsuda, Kizaki, & Ohno, 1999; Bose-O'Reilly et al., 2008; Bose-O'Reilly et al., 2010) investigated the issue of the effects of mercury on infants and children. However, anthropological studies of child development have received limited academic attention (LeVine, 2007). There is little ethnographic work that comprehensively examines children's involvement in mining sites and how their interactions with mining activities affect their development from a sociocultural

perspective. Indeed, Hilson (2012) has suggested that the presence of children at mining sites should be analysed from the perspective of the communities in question because there are cultural reasons behind these occurrences. Margaret Mead (1928, 1956) and Malinowski (1930) pioneered the anthropological study of children and childhood. Mead (1956) conducted an ethnographic study in Samoa. Mead (1928) argued that anthropologists should study children and childhood through the lens of other cultures, rather than from Western perspectives only. Therefore, I specifically explore people's perceptions of how mining affects children's health and development (Woodhead, 2009) from sociocultural perspectives.

I also draw on development studies about children from Bronfenbrenner (1960; 1979); Piaget (1969); Erikson (1950); Vygotsky (1978) to interpret children's issues, childhood, children's education and child development. I consider Piaget's (1969) theory of the four stages of children's cognitive development. I also utilise Bronfenbrenner's (1960) ecological theory of children's social development and Vygotsky's (1978) theory about children's social development. I refer to Erikson's (1950) theories of children's psychosocial development.

The data for this chapter, consists of observations of children's activities in mining sites, including their interactions with parents and other adults. I interviewed people in the community and government officials about children's issues and conducted a survey among parents concerning children in mining. I did not interview children directly because I did not have ethics clearance to do this.

This chapter begins with how the Bombana community perceives and defines children and childhood. I describe the socio-cultural factors behind the presence of children in Bombana mining. I also examine how Bombana society perceives the risks to children of mining activities. Next, I explore issues regarding children's education. Finally, I examine the cultural issues of children working as miners identifiable as child labour.

'You are no longer children' ('*Bukan anak-anak lagi*'): Cultural Conceptions of Children and Childhood

Bombana society, particularly the Moronene culture, has established definitions of children and rites of passage: for instance, blessing the womb ceremony, head shaving and circumcision. When a woman is in her seventh month of pregnancy, she undergoes a ritual called 'the seven months ceremony' (*acara tujuh bulanan*). This ritual acknowledges the presence of a new life and wishes good health for the womb (*jabang bayi*) and the mother. When the baby is born, the parents conduct a head-shaving ceremony (*acara potong rambut*),

with family and friends in order to bring good wishes for the child's survival and a good life. Before reaching *baligh*—which is approximately ten years of age—a child should be circumcised according to Islamic and Bombana traditions. Circumcision (*sunat*) marks a boy or girl as a mature person (*orang dewasa*). These head-shaving and circumcision rituals are conducted among the Bombana Muslim communities: a similar ritual had been discussed by Sila (2014, p. 156) among the Bima Moslems, and Hutagalung (2015, pp. 175-180) in relation to Kupang Moslems. In the Bombana community, both boys and girls are circumcised. Female circumcisions are also prominent in Bombana Moslem society.

The biological signs of puberty signal the coming of age of children and youth among Bombana people. They believe that when girls first experience monthly bleeding or menorrhoea (*menstruasi*) and boys first experience wet dreams (*mimpi basah*) they are no longer children (*Bukan Anak-anak lagi*). *Bukan Anak-anak lagi* implies that with these signs of puberty children should attain maturity, independence, and self-control. While preparing lunch on 3 January 2015, my neighbour Risma (a 25-year-old mother with two toddlers), complained about her young sister Intan (a 17-year-old). The latter was in Year 11 at Bombana High School. She said:

‘Intan is no longer a child because she has been bleeding every month. She is supposed to be looking after herself, washing her clothes and helping me with domestic duties after school. She is now a young lady (*anak gadis*) and has reached maturity (*sudah dewasa*). So, she should be more independent. How can she eventually look after her family if she is lazy?’

Because Intan had reached puberty, as evidenced by her menstruation, Risma expected her to be more mature and independent to face her future life as a mature adult.

Conceptions of child development in Bombana are slightly different from traditional academic conceptions of child development which divide childhood into stages: infancy (newborn from 0 to 11 months), toddlers (from 12 months to three years), pre-school children (from 3 to six years) and school-aged children (6–18 years old).



Figure 6.1 The feast accompanying the ritual of baby head-shaving. It requires specific foods such as sticky rice (white rice and black rice), various cakes, chicken/fish curries, and fruits. One set of items include a young coconut containing coconut water, banana leaves, and scissors, which are placed on the rice in the plastic pot. They are accompanied by bananas and the holy book of the Quran. A *Tolea* leads the *baca-baca* ritual (see chapter two)

In Bombana anyone who is married is considered an adult. Marriages in Bombana are based on the cultural ritual ceremony, and do not necessarily comply with Indonesian National Marriage Law (*Undang-Undang Perkawinan*). The Marriage Law No. 1 of 1974 dictates the minimum age of marriage as 16 years old for females and 19 years old for males. This marriage law has been reviewed by the Ministry of Women Empowerment and Child Protection

(*Kementerian Pemberdayaan Perempuan dan Perlindungan Anak/PPPA*), which decided that the minimum age for children to get married should be 19 years. However, the cultural and religious values in Bombana society are more deep-seated and influence people to get married at a younger age. While children under than 16 years who are married are considered under age and hence not allowed to marry by law, Bombana society still recognises them as adults. At Bombana mining sites, I met many boys and girls under 18 years who were married. They were regarded by the community as mature people who hold full responsibility and control for making decisions about themselves and their families, including engaging in various activities in mining.

The explanations above highlight that instead of following the formal and legal classifications of children according to the Indonesian government, people in Bombana have their own cultural definition of children and childhood. According to the Indonesian Government laws relating to the Convention of the Rights of the Child (*Konvensi Hak Anak/KHA*), Law No. 23/2002, article one, paragraph one about Child Protection (*perlindungan anak*), a child is ‘someone who has not yet celebrated his/her 18th birthday, including those who are in the womb’. In addition, the Ministry of Youth and Sports of the Republic of Indonesia refers to the Indonesian Youth Law No. 40 in 2009 to define the meaning of adolescence or youth (*pemuda*) as those aged 16 to 30 (Naafs & White, 2012; Parker and Nylan, 2013).

For a consistent definition of children in this thesis, I follow the Bombana local definition of children as people under 19 years who are not married. The word children (*anak-anak*) encompasses infants, toddlers, preschoolers, school-aged children and youths. I also use the term ‘young people’ interchangeably with children.

Cultural Reasons for Children’s Presence in Mining Sites

During my visits to Bombana mining sites, I saw and took photos of many young people. Children participate both directly and indirectly in mining activities. They directly participate in alluvial panning and digging in the riverbanks, along with lifting heavy loads. They indirectly engage in mining activities by accompanying their families to these sites; by providing other mining-related services such as selling food, cleaning, cooking, and minding younger children. I learned from some people that some children becoming involved in

prostitution around mining camps. Reasons for engaging directly or indirectly in gold mining activities range from family difficulties to individual dreams and ambitions.

‘Children and Parents Stick Together’: Parents’ Obligation from God

One of the parents who mined in Bombana informed me that the reason his children accompanied him to the mining sites was that parents and children should stick together (*anak dan orang tua harus hidup bersama*) and they should not be separated (*tidak bisa dipisahkan*). He added that God (Allah) has given parents their children in trust (*amanah*) to look after them, but also the children should obey their parents (*anak-anak harus menurut kepada orang tua*).

Bombana people—who mostly follow the Islamic way of life—believe that childcaring, child-rearing, and childbearing are parents’ obligations. Therefore, wherever parents go, their children should go with them. In mining areas, I saw many parents come with their families. Bronfenbrenner (1960) argued that children heavily rely on their immediate environment, which includes their parents.

Berbakti to Parents: Filial Duty, Filial Piety, and Sustenance Dependence

Most parents in Bombana believe that their children should maintain their *berbakti* to their parents (*berbakti kepada orang tua*). *Bakti* (filial piety), and *berbakti* (the active form of *bakti*, encompasses multiple terms and traits such as filial piety, dutiful, obedient, well-behaved, compliant, submissive, loyal, devoted, respectful, homage, loyalty, service, and line of duty. In Bombana society, it is a cultural tradition that children should maintain *bakti* or *berbakti* to parents, otherwise they will be punished by God and society. They believe that God will reward dutiful children if they maintain *berbakti* behaviour in their everyday lives. Each child should follow the moral standards in Bombana society to be recognised as a dutiful child (*anak yang berbakti*).

Some parents—who are also miners—that I met in Bombana mining areas stated that they expect their children to preserve *berbakti* duty and fulfill filial obligations to parents, such as contributing to their family’s livelihood by undertaking mining activities. Children start helping their parents at a young age, showing their obedience to them and helping them to overcome financial difficulties. I met a parent known as Bapaknya Amir (Amir’s father). He

told me that his son Amir (a 13-year-old boy) had protested because he had to work on his father's *dompeng* machine without regular payment. Amir's father expected his son to do the job out of *bakti* (filial piety) to his parents. He also expected his son to respect him as the patriarch and breadwinner of the family by following his wishes and instructions. The father sometimes gave Amir a small amount of pocket money (*uang jajan*) as payment. However, his son eventually refused to work for him and preferred to work with his peer group of friends, because he earned more money than when working for his parents. Amir's father considered Amir a rebellious child (*anak durhaka*) (see the next section about moral risks).

The concept of children's *berbakti* to parents at Bombana mining sites has some similarities with the cultural concept of the child-parent relationship and its traditional notions of filial obligation and parental dependence, as seen in urban America (Albert, 1990). Albert (1990, p. 319) argues that the idea of dependency of children must always 'go together' with their obligation to their caregivers. In Bombana mining cases, the caregivers are mostly parents. On the one hand, children depend on their parents to look after them; on the other hand, they have an obligation to follow the rules that their parents establish. Parents must be responsible for their children's development because society believes that children are not physically, mentally, or socially capable of taking responsibility for themselves. However, their dependence on their parents fully endorses parental control and authority over all aspects of their lives, which includes bringing them to the mining areas. Indeed, it has enabled parents to develop a scheme of parental control for their children. To maintain the dual ideas of 'children's dependence and parental obligations', I believe that both parents and children in Bombana mining society have developed a mechanism called 'sustenance dependence' relations, as proposed by Coppinger and Rosenblatt (1968). Parents look after and provide for their children and in return, the children carry out tasks to help their parents.

This model of reciprocal relations of *berbakti* in the Bombana community somewhat resembles the concept of filial piety found in contemporary East Asia (Kohlberg, 1969; Lee, 1973; Ikels, 2004; Hashimoto and Ikels, 2005). Filial piety, embodied in children, is encouraged by tradition, upbringing, self-interest (parents want their children to respect and support them in their old age), obedience, and moral sanction (Ikels, 2004). Moreover, filial piety (Ikels, 2005) as a product of culture also strengthens the control of parents over their children. In addition, filial piety is strengthened by moral dilemmas, as Lee (1973) and Kohlberg (1969) found among Chinese children. There are cultural and social factors that motivate society to reinforce filial piety in order to regulate children. Society will reward those

children who remain dutiful to their parents, serving as good children according to society's established standards of morality (Lee, 1973; Kohlberg, 1969).

Cita's *Bakti* as a Sibling Caregiver

One of the consequences of filial duties (*berbakti*) to parents is the phenomenon of children looking after other children, specifically as caregivers to their siblings. This culture is nurtured in Bombana mining society. Parents expect older siblings to look after the younger ones while they carry out mining activities.



Figure 6.2 Cita conducts panning activities while her siblings watch her



Figures 6.3 Sibling caregivers

On 28 May 2015 at the Padambila mining site, I met Cita, a nine-year-old girl who came to visit her parents and siblings at the mining site during a school holiday. She helped her family to find *rezeki* (see chapter two) from crushed rock material, an activity known locally as *marempel* and panning. While her mother was doing *marempel* and looking after her infant sister, Cita was babysitting her two toddler siblings who came to play and watched her panning. She was one of those children who unintentionally came to work in mining, maintaining her filial duty (*bakti*) by helping her family with domestic chores such as cooking, looking after her siblings, and assisting with mining. Her mother told me she was a good child who performed her filial duties, and she regarded Cita as a child already showing her *bakti* or *berbakti* to her parents. Her mother prayed to Allah SWT, the only God in Islam, to grant Cita a good life and future. Cita's parents, and most parents who are miners, encourage their children to fulfill filial duties as sibling caregivers from a young age, in order to maintain close and intensive interaction between parents and their children and to strengthen family bonds.

The concept of *bakti* has the same function as the filial piety mechanism that is used to control morality (Kohlberg, 1969; Lee, 1973) among children. In the next section, I will explain how parents view moral as well as physical risks to their children.

Mining Risks on Children

Moral Risks: Enforcing *Bakti*, and *Pemali*/Taboo, Labeling Sinful Child (*Anak Durhaka*)

A female miner told me that she did not want her child to be influenced by the mining environment as it encouraged negative morals and behaviours, such as alcohol abuse, and gambling. She believed those behaviours promoted negative morals and were forbidden (*haram*) according to her Islamic values.

Parents in Bombana echoed these concerns about the moral risks to their children as a result of unfiltered information from television, received via a satellite dish receiver, through which people watched various channels from overseas. I saw that most local miners in the village had bought a television set. This device was blamed for promoting Western ways of life through showing acts such as kissing and hugging: acts considered pornographic by some members of Bombana society. In addition, I heard that when a local 14-year-old girl was raped by her boyfriend and other males, the community deemed this event evidence of teenagers' bad morals resulting from watching television and internet content via mobile phones, which they believed promoted sexuality and pornography and thus triggered negative behaviour like rape.

In this thesis, I categorise these potential negative morals, behaviours, and attitudes as moral risks according to the local culture and values. Moral risks include all potential hazards and risks that can jeopardise children's morals, attitudes, and behaviours according to principles of right and wrong in Bombana mining society. These moral hazards can prevent children and youth from developing good morals, obeying parents and village elders, having self-confidence and empathy, maintaining good behaviour, and building strong character according to the cultural and religious values of Bombana society.

There are some strategies applied in Bombana culture to protect children from these moral risks. I explained in the previous section about a strategy to condition children to be *anak yang berbakti* (dutiful children). Other strategies that parents and the Bombana community employ are parental control mechanisms over children's morality. These control mechanisms include enforcing *pemali*, or taboo, making it clear to children what activities are taboo, and labeling children who misbehave as *anak durhaka* (rebellious child).

Pemali is the local term for taboo and it has been used by the Bombana community to counter what is locally considered negative morals, attitudes, and behaviours among children. *Pemali* means taboo or prohibited and is based on *adat*/tradition and social conventions, habits, and customs. *Pemali* refers to negative morals, attitudes, behaviours, or thoughts that are forbidden according to local values, norms, and social standards. Information about what is good or bad is conveyed by being forbidden (*dilarang*) or allowed (*dibolehkan*). This follows the unwritten rules that govern what Bombana society believes should be done or not done, for example what should be eaten or not eaten. Some *pemali* are derived from religious values; for instance, the Islamic values of forbidden (*haram*) and allowable (*halal*) foods.

I once stayed until *Maghrib*, or afternoon prayer time, in the Padambila mining site and suddenly most parents ordered their children to go back to their blue tent huts. It was *pemali* for children to play outside their huts during this time, because they believed that Satan would eat or hurt them. On another afternoon, Rosnia and Rais Pak Desa told their children not to go outside the house during sunset time because of *jinn*, and they warned their children that *setan* (Satan/the Devil) would frighten them. In addition, it is *pemali* for young girls and boys to sit in the middle of stairs because *setan* could pass by them and push them off the stairs. Other miner parents stated that it is *pemali* for children to engage in gambling activities.

One of the community leaders, an elder (*orang tua kampung*) called Zubair, revealed that in Bombana society children are always expected to follow their parents' rules, social norms, and values, and also to avoid *pemali*. Parents pass on their beliefs about *pemali* to their children to maintain their traditions, and they expect children in turn to have good morals, as expected by Moronene society. People, particularly children, are not allowed to complain or question the rules, but must just abide by the rule of *pemali*; otherwise, bad luck will come to them.

Parents in Bombana society have full authority to decide what is good or bad, and allowed or not allowed, for their children or youths and to enforce the *pamali*. Whatever the parents' conceptions about *pamali*, children should follow without question. Sometimes children have no option and no voice to raise their own ideas about these issues. It is *pemali* to be disloyal to parents verbally, or in attitude or behaviour. Some parents told me that sometimes they had no idea about why something is *pemali*, but they expect their children to follow what they have been told by their parents and elders. Moreover, most parents at mining sites told me that children should obey parents' and societies' commands and rules as part of their filial duties.

When a child does not follow the *pemali* rules, values, and norms in their family or wider society, all elements in Bombana society including parents, family members, relatives, and the community will label them as *anak durhaka* (a deviant child). Among the Indonesian

community, the label of ‘deviant child’ generally means bad, rebellious, or sinful child and it would be very shameful for children and their family members if a child is negatively labeled deviant. Raybeck (1988, p. 371) and Douglas (1966, p. 115) noted that individuals who transgress social values and boundaries are labeled as sinners and stigmatised in society. In this case, the Bombana society judges that a rebellious child (*anak durhaka*) has committed a sin and stigmatises them as a bad child or shameful child.

The punishment for being *anak durhaka* not only comes from society but is also believed to come from God. The Bombana society believes *anak durhaka* go to Hell instead of Heaven when they die, according to Islamic teaching. The majority of Muslim parents encourage their children to obey them, uphold Islamic values, and follow good moral precepts, avoiding *durhaka* behaviour.

Work and Play in Mining Playground: Physical and Biological Wellbeing Issues

Bose O'Reilly et al (2008) state that the mining environment poses risks to children's and infants' well-being, particularly the risks of mercury. Indeed, parents who take their children to mining sites are putting their children at risk physically and psychologically. In this section, I investigate miners who are also parents and their perceptions about the risks of the mining environments and activities to their children's physical and biological development.

Some parents at Bombana mining sites revealed that while they believe the mining environment is not good for children, they have exceptional reasons for bringing them there. They felt they had no other choice than to take their children with them to such harsh mining environments and to involve them in various mining activities. The parents reasoned that they must work as miners and live in the mining camps in order to generate a livelihood for their family and for their children's future. Hilson (2002; 2012) noted that children in Ghana mining sites mined with their families for economic reasons, to escape poverty.

In addition to making a living, as parents they also carry responsibility for taking care of their children, as part of their obligation to maintain trust (*amanah*) from God. Unquestionably, parents were also concerned about the risks of mining on their children. However, their poor circumstances as well as moral obligations had forced them to expose their children to risky mining areas, despite knowing that the hazardous environment will subsequently affect their physical and biological development. Ultimately, moral and economic reasons have forced parents to involve their children in Bombana mining.

Some parents gave practical reasons for exposing their children to the mining sites and allowing them to work as child miners. For instance, Ahmad's parents said that they provide role models of good and competent miners for their children. They want their children to inherit their skills and knowledge as miners and to master their profession. Ahmad's mother said she desired that Ahmad be a brave child and have courage to go down into deep shafts. She expected he would help his father and his siblings to mine. Ahmad was assigned to lift rock materials containing potential gold from approximately 15 to 20-meter deep holes. His father and ten-year-old brother worked at the bottom of the rat hole to collect materials. His mother was responsible for directing the bamboo winch up and down while looking after her younger daughter.

Ahmad's mother reasoned that the more Ahmad practiced bringing the material up from the ground, the more he would foster his bravery and skills so he could work as bravely as his father in years to come. To Ahmad's parents, their children were helping them escape from poverty, which was the most important aspect of their family's journey. While she expressed concern that Ahmad would fall into the shaft, she was ultimately sure that this was unlikely to happen because the rope was under her control.





Figure 6.4 Ahmad emerging from a rat hole and his mother lifting him up using a bamboo winch

However, most parents in Bombana mining have concerns about dramatic physical incidents such as ground collapse, where children fall into rat holes or *dompeng* holes. There had been around 30 incidents each year of children falling into mining holes including *dompeng* holes, rat holes, and excavator holes. One of the most shocking events occurred in Wumbubangka village, when a ten-year-old girl died after slipping into a ten meter deep, watery and muddy *dompeng* hole while playing with her two siblings at the back of the tent where she lived with her father and siblings. Her seven-year-old brother, who tried to save her, was also drawn into the hole and died. Following the incident, the community expressed concern about children's safety to the mining company PT. SUN, and an officer was asked about their responsibility regarding the accident. The mining company paid compensation of 10 million rupiahs (approximately AUD 1,000 in 2014) to the father.



Figure 6.5 A child walking alone around the rat holes area

Although parents are afraid of their children falling into a shaft or rat holes, they typically exercised loose supervision over their children. At Padambila mining sites, I saw many children walking around the ‘rat holes’ (*lubang tikus*) alone and playing freely in the bushes and around the entrances to the rat holes.

While voicing concerns about the physical dangers in the unsafe environments at mining sites, most parents raised the issues of disease and illness in relation to poor environmental hygiene and sanitation. Most parents were unhappy with the unclean water available at mining sites (see chapter two) that contributed to the incidence of infectious diseases such as diarrhea and itchiness/dermatitis (*gatal-gatal*) among their children. There have been traumatic incidents, such as when many children and youths died from diarrhea during an outbreak at Tahi Ite mining site in 2009. When I cross-checked this information with the nearby community health service (*pusat kesehatan masyarakat/Puskesmas*) in Taubonto, the officers confirmed that *gatal-gatal* (dermatitis) is the most common of the top ten diseases among children in the Rarowatu sub-district, which includes the Rau-rau mining areas. Approximately 80% of the children in Bombana came to the *Puskesmas* with symptoms of dermatitis developed around the mining sites. Ultimately, some parents do not have safety precautions to prevent the diseases. I saw a mother who went against all the safety precautions preventing dermatitis set

down for panning. She encouraged her child to work with bare feet, without using waterproof boots to protect their feet from the dirty, muddy water.

I observed many children and youths carrying out panning and *trommol* operations. They touched mercury with their bare hands when panning during carpet washing time (*cuci karpet*). During my research I met Asnun, who was working as an amalgam burner (*pembakar amalgam*) in Padambila mining camp. He did not use a mask or wear a shirt while burning a gold and mercury amalgam, so most of his body was exposed to the mercury fumes. Some children were also involved in the *trommol* machine process. I saw Ahmad pour mercury into the *trommol* drum and handle mercury with his bare hands during the *matoyong* time.

While some people in the Bombana mining community recognize that mercury poses a risk to children, most parents have their own perceptions of the risk of mercury to their own children (see chapter four about mercury and ignorance). Although scholars (O'Reilly et al., 2002; 2008; 2010) have raised concerns about the negative health impacts of mercury on infants and children in other areas of Indonesia, for parents and children in Bombana mercury is not considered a risk because it is unseen. Most parents and children did not know what mercury is or what harm mercury can cause their children. Rather they had their own category of risks. This phenomenon corresponds with what Ellen and Soemarwoto (2010) found among Kahayan miners, who similarly had not included the issues of mercury in their traditional cosmologies of gold mining risks.

In most mining areas, I witnessed parents cheering their children on when playing in the tailings, where there is muddy water contaminated with mercury. The tailing dam has become a children's playground, where young people played in the muddy water inside the tailings dam that contained mercury (*air raksa*) from a trommel. The parents allowed their children to play there with no concern about the danger from mercury. One parent told me she did not understand the consequences of mercury exposure for her child because she had no knowledge of mercury. She did not even know what mercury was, yet she knew about *air raksa* (see chapter four). Ultimately, most parents revealed they did not worry about the unforeseen risks of *air raksa* (mercury).



Figure 6.6 Ahmad playing around the *tromol* areas and handling amalgam with his bare hands

Also, parents mining in Bombana do not consider smoking among children as a risky practice for their children. I observed many fathers smoking around their infants and children. Some of them share cigarettes with the children, and youths commonly smoked while mining. From 200 total population I surveyed, about ten percent of young people (aged 18 years to 30 years and have not married) smoked cigarettes. Only around five percent of children (under 18 years) admitted/witnessed smoking cigarettes). I witnessed a boy, approximately ten years old, who dug gold materials, wearing a sarong and shorts, smoking with adults and other children. They smoked with self-confidence in public, just like adults.



Figure 6.7 A ten-year-old boy smoking with adults at the Padambila site

Widespread smoking among children and youth in Bombana is due to a variety of factors including maturity identity, gender, *pokompolulu* culture and individual choice. Some children smoked because they struggled for acknowledgment of their maturity: in other words, by smoking children were demanding acknowledgment that they were no longer children (*bukan anak-anak lagi*). Another factor is gender-related because smoking signifies masculinity. I only met boys who smoked and no girls who smoked in Bombana society. The boys smoked to prove that they are masculine like their fathers. Those boys who smoked were also bowing to peer pressure. Cultural smoking practices of Moronene, called *Pokompolulu* (see chapter five on gender and *pokompolulu*) also influence children to smoke, in order to be recognized as important people in society. Rosemary, Susilawati, Rahmani, & Anisah (2021) noted that socio demographic background and individual characteristics including culture, gender, etc. also influenced smoking. Young smokers in Bombana have similar cultural habits to other Indonesian young people. Indonesian young adults struggle to prove themselves as men; the belief that smoking is not dangerous; and their fight to escape childhood dependency (Ng, Weinehall and Öhman, 2006).

The SATAP-One Roof Integrated School: Invest and Disinvest in Children's Education

This section investigates how socio-cultural factors influence miners' decisions concerning their children's access to formal educational facilities. It explores how these decisions impact on their children's intellectual and social development.

Economic issues and geographic conditions exacerbated by poor transportation infrastructure have hindered parents from gaining access to schools for their children. Ahmad's mother (see the introductory vignette), who lives in a remote mining area, revealed that her family had to deal with the lack of transportation, poor road conditions, and their poor economic circumstances if they wanted to enroll Ahmad and his siblings in the nearby government/public school. If his parents decided to take the children to the nearby school, which is SATAP Tahi Ite, they would have to spend around 100 thousand rupiahs (approximately \$10 AUD) to pay for the *ojek* (motorcycle) transport (per child per day). This high transportation cost is out of her family's reach because the income from mining activities does not add up to this amount. Moreover, the parents considered going to school a time-consuming activity because it takes one hour for the children to travel from the mining camp to the nearest primary school over rocky, slippery, and dusty roads. They argued that their children should instead spend their time mining and help them earn money.



Figure 6.8 The SATAP school of Tahi Ite is located in Tahi Ite hamlet

Cultural construct and values also played a significant role in preventing miners from sending children to school. Ahmad's mother told me she felt that the children would be better off if they master mining skills rather than going to school. She taught her children basic life skills at home as well as mining techniques. She was happy for her children to help the family find gold in their shaft or 'rat hole' (*lubang tikus*) to preserve their livelihood. The practices of the non-agricultural families provide a contrast with the overall education statistics in Indonesia for families that invest in school education to enable their young generations to be better educated than previous generations (Robinson, 2016; White in Robinson, 2016, p. 16; White & Margiyatin in Robinson (2016)).

However, some migrant miners have strategies to support their children going to school. According to my local survey of 200 migrant miners, approximately 70 percent enrolled their children in school. Akifa told me she had left her five-year-old daughter with her parents in South Sulawesi province because she was concerned about her education. She and her husband could not juggle mining work and looking after their child. They believed that the grandparents could provide the same quality of caring and love for their child. There were also migrant families who enrolled their children in and gained benefit from local educational facilities. These families considered investing in children's schooling a priority for a better future.

Another factor that inhibits parents from accessing children's education facilities in mining camps was the lack of support from the local government for local educational facilities. The Bombana government has not built any schools for children living with their parents at the remote mining settlements. When I visited Roko-roko mining camp, a female miner encouraged us to urge the local government to build a health service post and a school for their children in the settlement. According to one Bombana government officer—Makmur, the Bombana Environmental Agency (*Badan Lingkungan Hidup/BLH*) officer present during our visit to the Roko-roko mining site on 5 November 2014—Tafdil, the current district head (*Bupati*) of Bombana, was willing to support the migrant miners in the mining camp. He added that the *Bupati* wanted to build some schools at the mining camps. However, some miners were regarded as illegally mining in these areas; in fact, Roko-roko was legally recognised as a forest concession area by the national government. Consequently, Makmur stated 'It is an illegal gold mining settlement, so no schools and health services are allowed to be built there'.

However, the Bombana government has renovated and recently built a new government school for the children of local and migrant miners in Rau-rau village. Some local miner parents chose an old established renovated school for their children, which is in the Lasangi hamlet in

the heart of Rau-rau village. The school is called the Rau-rau SATAP, which is located some distance, around 20–25km, from those mining settlements. Most migrant parents who are willing to help their children pursue a better future could choose a school in the Tahi Ite hamlet located near the mining settlement. The Tahi Ite SATAP is located around 15km away from the mining settlements (Roko-roko, Polodu, and Laronene). The new government school in Tahi Ite hamlet was built during gold rush era in 2008 when the population significantly increased by almost five hundred percent. But, as noted above, the high cost of transport make it impossible for children from remote settlements to attend these schools. Parents would have to spend a huge amount of money for *ojek* (motorbike) to take their children to school.

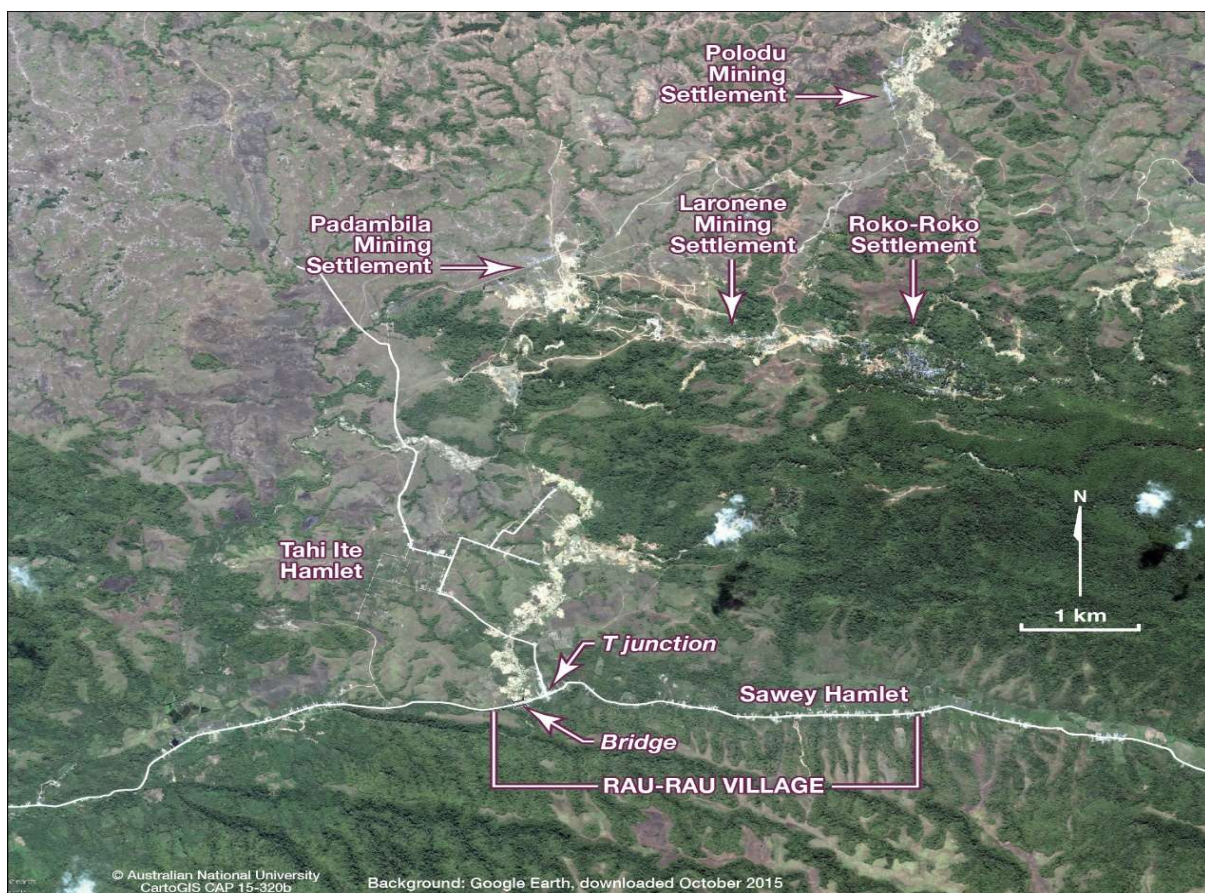


Figure 6.9 Map of the mining settlements in Rau-rau village

For early childhood education, there was a government education facility for pre-school children in Rau-rau village called *Pendidikan Anak Usia Dini (PAUD)* or *Taman kanak-kanak (TK)*, a permanent brick building with some limited outdoor playing facilities such as swings. It was located behind the office of the village head. The building was funded by the central government through its national project—called *Program Nasional Pedesaan Mandiri/PNPM*—during the period of the program from 2008 to 2014. This project funded

buildings and facilities for pre-schools / *Pendidikan Anak Usia Dini (PAUD)* in every village around Indonesia, including in Rau-rau (Syukri, Mawardi, and Akhmadi, 2012). Most children in Rau-rau aged from four to six years went to the *PAUD*. The Bombana local government recruited casual teachers on contracts and they received incentives from the Bombana local program called *Gembira Desa*²². Every teacher was paid 600,000 rupiahs (approximately \$60 USD) every three months. These casual teachers did not get regular monthly salaries which permanent teachers did.

For school-aged children, there were two formal education facilities located in Rau-rau village, called *SATAP* Rau-rau and *SATAP* Tahi Ite. The acronym SATAP stands for *Sekolah Satu Atap*, which means an education under one roof. The *SATAP* integrates primary school (*Sekolah Dasar/SD*) and junior high school (*Sekolah Menengah Pertama/SMP*), accommodating children aged from 6 to 15 years. Although the SATAP involves the idea of *satu atap* (one roof), the Rau-rau *SATAP* has more than one building. The primary or elementary school (year one to year six) and secondary or junior school (year seven to year nine) students were accommodated in separate buildings. Formerly, the management of *SATAP* was led by one school principal. In 2015, the school management was divided into two areas—primary school and secondary school (junior school)—with two heads of school (*kepala sekolah*). Although the two schools have separate management and heads of school, they use the same teaching and learning resources in the *SATAP* Rau-rau village. Those schools also employ the same teachers, contacted teachers and support staff. Those teachers were alternately teaching primary and secondary students. For instance, a teacher, Budi who teaches biology for secondary school students also sometimes taught Year One students in primary school if there were not enough teachers in the allocated time.

Most students from Rau-rau village who want to continue high school education must go to the senior high school in Taubonto village, located approximately 10 kilometers away. This senior high school caters to students from villages near the Taubonto district. There were also some students from Rau-rau village continuing their high school in Poleang district, located in

²² *Undang-Undang Otonomi Daerah* (Regional Autonomy Law) No. 32 in 2004 states that a region has rights, authority, and the obligation as an autonomous region to organise and manage its own affairs, governance, and community interests in accordance with statutory regulations. To drive development acceleration along with other regions in Southeast Sulawesi Province, Bombana Regency announced a special program that aims to improve community welfare through the special movement called *Gerakan Membangun Bombana dengan Ridho Allah SWT* (Movement Program Building in Bombana with God's Blessing) with the acronym *GEMBIRA*, well-known as *Gembira Desa*. This program aimed to accelerate development and community welfare as the main goal for Bombana Government for the period 2011– 2016.

the vicinity of the Rau-rau village. It takes approximately 30 minutes trip from the heart of Rau-rau village to the school in Poleang District.

I conducted a formal interview with Sabri, the school principal of *SATAP* Primary School on 20 November 2014. I did not meet Budiman, the head of *SATAP* Junior High School because he was away for family reasons and lived in Taubonto village. The head of the primary school inform me that the original *SATAP* school was called Rau-rau primary school (*SDN* Rau-rau) and it was built before gold rush started in 2008. Children wanting to continue their secondary (*SMP*) and tertiary school (*SMA*) had to go to Taubonto village. During the gold rush era, the numbers of enrolments for children in the primary and junior schools in Rau-rau village increased. Due to large numbers of migrant miners enrolling their children in Rau-rau primary schools and asking for more secondary schools for their children, the Bombana local government expanded the primary school to become a *SATAP*.

Although the number of enrolments increased, there were limited education facilities and teachers to support the school's education and learning processes. The Bombana government did not supply sufficient funds to support the increasing numbers of students. The *SATAP* has limited budget resources to buy stationery, books, and other learning materials such as chalk, black board and books. Teachers with qualifications and listed as civil servants were very limited. To fulfil the ratio of teachers to students, the Bombana local government recruited casual teachers and volunteers. Some casual teachers had no teaching qualifications and had to teach children with no financial incentives. The only reward they hoped for was that they would be accepted as civil servants one day if the local government had vacancies, called *K2*. Although the educational facilities were built as permanent brick buildings, the poor school infrastructure and maintenance issues—such as leaky roofs during the rainy season—remained problematic. Teachers stated students needed to be prepared for their classroom to leak.

The head of *SATAP* and Pak Desa Rais expressed concern about the increasing number of local children dropping out of school since mining began. Although there were increasing numbers of migrant children's enrolments, about 30 local children living near the school were identified as having dropped out school, mostly from Years Seven to Nine (*Sekolah Menengah Pertama/SMP*) or junior school. The most common reason cited for dropping out was that children were attracted to earning money from mining. Other people stated that peer pressure to mine also contributed to their dropping out of school.

Local mother Narni—whose husband was a miner—told me that she was upset with her fourteen-year-old son, Udin, because he did not want to continue his second year of Secondary High School (*Sekolah Menengah Pertama/SMP*) in the *SATAP*. Although she and her husband

asked him to cease mining activities, he refused. He preferred to earn money by panning and also occasionally as *dompeng* crew because he could earn fast cash money to fund his social life. Narni had expected him to continue his education and to go to the local university, and eventually get a good job, as a civil servant. She anticipated he would earn a lot of money to raise the family's fortunes, and enhance the family's social status, attaining a desired and respectable position in the village. However, her son chose to leave school.

Child Miners: Family, Peer Influences, and Individual Motivations

In this section, I will explain how socio-cultural issues have motivated the children's decisions to participate in mining activities. I define child miners as those children aged less than 18 years who are working and getting paid for that work in mining sites, as well as those who have participated directly or indirectly. Magdalena, Sukamdi and Rofi (2021) categorised children aged 10-17 years as child labor. As noted previously, children directly participate in alluvial panning and digging in the riverbanks, or lifting heavy loads of gold. They also engage in mining indirectly by accompanying their families to mining sites and participating in mining-related services, such as selling food, cleaning, cooking, and looking after younger children. Some become involved in child prostitution around mining camps in Bombana.

There are three types of social and cultural motivations for children to become miners: family encouragement (filial piety, sustenance dependence, and parental control); peer influences; and individual motivation for economic independence. Similar patterns can be seen with the agriculture sector across Indonesia (Bessell, 2009; Minister of Manpower of Republic of Indonesia, 2021; International Labour Organisation/ILO, 2004). There are two causes for children engaged in labor force in Indonesia: firstly, household socio economic factors, poverty being the main cause in this case, and secondly regional contextual factors such as age, gender and school status (Magdalena, Sukamdi and Rofi, 2021).

As I have described in the above sections, family members—particularly parents—carry responsibility as role models for their children to be miners. Some children who are engaged in mining activities are working to help their parents out of obligation to fulfill their filial duty of sustenance dependence (see the stories of Ahmad, Amir, and Cita).

Wanting to help their new families and to be economically independent has motivated married children aged between 15 and 18 years. Those I interviewed stated they came to mine to keep their new family economically stable. They work for cash money in mining because

they do not have the skills to work in manufacturing industries, such as building or carpentry (*pertukangan*). They also have no business skills or capital to set up a business. They choose mining activities to obtain cash for their family to fulfil basic needs, such as milk for children, food, and building materials for shelter.

For school age children, obtaining fast cash and pocket money gives material independence and this mostly drives the children to engage in mining activities. Cash can be used to buy school equipment and help parents to pay school fees. Most children and youths who engaged in mining activities revealed that it is good to have their own money (*enak punya uang sendiri*) because they can buy anything they want without asking their parents and obtaining their permission. This shows a spirit of material independence that young people want to express in the context of their parents' poor financial predicament.

Children are also eagerly looking for money through mining because of peer influences. Most child miners were looking to earn cash to buy mobile phones and credit (*pulsa*) to make calls and access the internet in order to be regarded as modern, but also to enjoy those activities. If children can afford to buy technological goods (such as a mobile phone) or consumer goods (such as cigarettes and alcohol), they fit easily into peer groups. Consequently, the peer group exerts a critical influence in inducing children and youths to work in mining areas and even encouraging them to leave school (see the vignette about Narni in the previous section).

‘No children in mining?’: A Cultural Analysis of Bombana Child Labour and Child Miners

This section will explain the anthropological definitions of child labour (*pekerja anak*) and child miners (*penambang anak-anak*). If we compare the description of child labour, found in global and national debate, as children exploited by companies for of their labour, with the anthropological definition of *pekerja anak* and *pekerja tambang*, we find that, in anthropology, ‘child labour’ differs from the definition of social and economic scholars (Magdalena, Sukamdi and Rofi, 2021). To get clear answers about the definition of child labour from local Bombana perspectives, I visited several mining companies to get information about definition of *pekerja anak* in formal working environments (mining companies). I also interviewed informal child labourers who were not engaged in mining companies formally. In addition, I reviewed several national regulations about child labour.

From the perspectives of officers in mining companies in Bombana mining sites, theoretically children were not allowed to work in concession areas of mining companies. The head of PT. Dynasti mining company, Pak Arif, informed me that no children were allowed in his mining concession areas because of laws which prohibited child labour (*pekerja anak*). However, when I walked around his concession, I met many children who were working as *dompeng* machine operators and some who were panning while playing with friends in the *dompeng* areas. Although the head of the company understood the prohibition against child labour, he and other people in the Bombana community did not perceive children's involvement in mining activities as child labour (*pekerja anak*). Rather, they believed that child workers and children working in mining (*anak bekerja di tambang*) was allowable, and frequently called some of those children *anak-anak penambang* (child miners).

People I interviewed employed various terms to explain children's employment in Bombana mining industries. Those acquainted with the laws about child labour—for instance, Pak Arif—avoided using the term *pekerja anak* to describe children employed in his company because he does not want to suggest that his company breached the law. I mostly heard the term child labour (*pekerja anak*) from people who work in mining companies and from government agencies such as *BLH* and the Mining and Energy Department. According to them, *pekerja anak* means children engaged in formal employment in the industry. However, the term *pekerja anak* applies to children who formally or informally work in mining companies.

Pak Arif's company, Bombana-based mining companies, and government offices follow the Indonesian government's definition of child labour according to the International Labour Organisation (ILO). Child labour includes all children under 18 who are working voluntarily or forced to be employed to earn money from employers (ILO, 2004). In addition, Indonesia government ratified the UN Convention on the Rights of the Child of 1990 in 2002 and passed Law No. 23 in the same year, which categorises child labour as all people who work in mining sites under 18 years of age. Based on those laws, children who come to Bombana mining sites and work voluntarily helping their families are categorised as child labour (*pekerja anak*).

The children who work in Bombana mining that people recognised as 'child miners' are in fact active actors (Kitada, 2005) who are independent in defining their own way of life. They do their best to help their families escape poverty and fulfil their filial duty (*berbakti*) (see Cita's story about the sibling caregiver and Ahmad's story). Voluntarily working as miners—for example, doing *marempel* and getting in and out the shaft (*lubang tikus*)—becomes part of their play activities and is meaningful to their lifestyle. Some children treated mining sites with deep shafts and bushes as their playground. I saw some children jump up and down the tailing

canals while laughing and chatting with their friends. When I saw the smiles of Ahmad, Cita, and other children's faces in mining sites, this reinforced that mining sites have created good childhood memories for them.

To address issues of child labour (*pekerja anak*) in Bombana, the government and local stakeholders must also understand the perceptions of the local culture in relation children's work. Kitada (2005) and Hilson (2012) suggested that policy makers who are concerned about children in mining areas need to view the issue in its local context instead of making universal judgements which reflects Western concepts. For instance, Bombana government needs to understand child labour (*pekerja anak*) from the local cultural perspective during the implementation of the Indonesian government's National Plan of Action on the Elimination of the Worst Forms of Child Labor (WFCL). This law was announced in Presidential Decree No. 59 in August 2002. This national plan targeted the first five years of the twenty-year program to eliminate five forms of child labour: children who are engaging in the sale, production, and trafficking of drugs; child trafficking for prostitution; and child labour in some sectors, such as footwear, mining, and offshore fishing (ILO, 2004). The Indonesian government has promised to "take immediate and effective measures to secure the prohibition and elimination of the worst of child labour as a matter of urgency" (Minister of Manpower of Republic of Indonesia, 2021).

Conclusion

'Children' and 'childhood' in Bombana are political, social, and cultural constructs. Politically, the Bombana people follow the national laws of Indonesia that define children as people under the age of 18 who are not married. According to local social and cultural constructions, Bombana people construct childhood according to biological signs and rituals. Children with biological signposts of puberty—girls beginning their periods or menorrhea (*menstruasi*) and boys experiencing wet dreams (*mimpi basah*)—are considered mature and no longer children. The passage through rituals—for instance, circumcision and marriage rituals—also marks the stages of children moving from childhood to adulthood, that is, *bukan anak-anak lagi* (no longer children). The cultural construction of life stages moving from childhood to adulthood was also researched by Bennet (2003) who found marriage was the cultural event that marked girls to become female adults or young mothers.

Ahmad and other children become involved in the Bombana mining sites due to socio-cultural factors related to childbearing and childrearing. Mead (1928) notes that the cultural factors of childbearing and childrearing differs from Western approach. In the concept of childbearing and childrearing in Bombana society, a child is seen as God's *amanah* (mandate). As God's mandate, parents should look after their children in both joyous and sad conditions. Parents also have a critical responsibility to nurture children's character traits and influence them; these will imprint on children's comprehensive development because they are in a child's immediate environment (Bronfenbrenner, 1960). There were many children working to support their households by performing various mining activities such as *dompeng* and panning. They also served as sibling caretakers while their parents mined. The phenomenon of child miners reflects *berbakti* or filial duties of children. This behaviour is morally positive and encouraged in the society. Children carry out mining activities while fulfilling filial duties and maintaining good morality (Kohlberg, 1969; Lee, 1973).

The condition of children working as miners at Bombana mining sites parallels with Kitada's (2005) findings among street children in the Philippines: that children are active actors who possess their own agency to decide to work to earn money, and this process is part of enjoying their childhood stage. Children who have become involved in mining also navigate their agency to do productive mining activities by mimicking adults, particularly their parents. In addition, children's involvement in mining is seen by Bombana society as creating a meaningful childhood experience, where the mining area becomes the children's playground. I observed many children playing while working, or working while playing, at the Rau-rau mining sites. Uniform use of 'child labour' (*pekerja anak*) to refer children working in Bombana mining should be reconsidered, as children enjoyed their childhood in mining sites, working through playing or vice versa.

Parents mining in Bombana tend to care more about moral risks to their children over risks to their children's psychological, physical, and educational development. The parents care more about these moral risks because Bombana society has ideas about social control that is influenced by the Moronene culture. Bombana society has strategies to control children's morality, attitudes, and behaviour in order to direct children towards embodying good morals. This includes strategies imposing the moral of *bakti* (filial duty) on children, conditioning cultural taboo mechanisms involving *pamali* or *pemali* (shunning), and imposing the label of *anak durhaka* (rebellious child or sinful child). The parents care less about physical risks because of cultural constructions of what is risky and not risky for them (Douglas & Wildavsky, 1982). Most parents acknowledged physical risks that worry them include their children falling

into a tunnel or tunnel collapse. However, their preventive efforts to protect their children from these hazards are very poor. Moreover, parents were not aware of the risks of mercury on their children. In addition, they paid very little attention to their children's educational needs.

In Bombana the presence of children working and living in these mining areas is considered to be the family's business, not the government's business. However, Bombana society has not integrated the issue of child labour into its perceptions due to various socio-cultural factors, including sustenance dependence, balancing filial piety, and parental controls. In addition, the issue of child labour has not become worthy of consideration by other stakeholders in the Bombana community including government, mining company officers, and the mining community more generally. From several discussions I had with officers from the Mining and Energy Department of the Bombana district, no officers agreed that child workers were a suitable topic for discussion. One of the government officer said they had not been informed by the central government about the critical problems of children working at mining sites. This shows that the local government officers have not recognised the presence of children in mining sites as a child labour issue. The Minister of Manpower of Republic of Indonesia (2021), ILO (2004) and scholars (Harsch, 2001; Henne and Moseley, 2005; Webbink, Smits and De Jong, 2011, Hilson, 2008; 2010; 2012) have expressed concern about the issue of child labour in mining areas. Some scholars have also used the term child labour to emphasise the negative conditions of children working in hazardous mining sites, to highlight that they will face many social and public health issues (Hilson, 2008; 2010; 2012; Hinton et al., 2003).

However, the Bombana community does not view the various modes of children's engagement in Bombana mining as forms of child labour. They used terms including child labourer (*pekerja anak*) and child miners (*penambang anak-anak*) but these terms do not convey a sense of children's work being exploitative. Although the terms child labour and child miners attract concerns from government and international organization (ILO, 2004), local people in Bombana did not consider 'child labor' as a problem in society. They expect children to perform duties (*berbakti*), or reciprocation (*balas budi*) to their parents and families and, like farming children, contribute to the household economy.

In the next chapter, I will explain how the Bombana government manages the comprehensive risks of mining activities by examining its health governance using governmentality theory.

Chapter Seven

Walking Independently (*Jalan Sendiri-Sendiri*): Health Governance, Risk Management and Risk Communication

Before conducting my field research in Bombana, I contacted Tarsan, the Head of Environmental Health for the Bombana Health District Department (*Dinas Kesehatan/Dinkes* Bombana). The Health Department is recognised by Bombana society as one of the district government bodies that manage health issues in Bombana, along with the Environmental Health Department (*Badan Lingkungan Hidup*) and the Mining and Energy Department (*Dinas Pertambangan dan Energi*). Tarsan frequently mentioned that every government institution was acting independently (*jalan sendiri-sendiri*: literally ‘going alone’) when managing mining-related problems. There are no collective or collaborative actions coordinated by the district government to manage the impacts of mining on the Bombana population. This chapter will examine health governance, risk management and risk communication in relation to gold mining in Bombana.

Health governance refers to ‘the actions and means adopted by society to organise itself to promote and protect its population's health’ (Dodgson, Lee and Drager, 2002, p. 6). ‘It includes formal and informal rules applicable to individuals, communities, nations, and globally, whether in public, private or in combination’ (Dodgson, Lee and Drager, 2002, p. 7). The World Health Organisation has identified specific features of health governance: ‘the attempts of governments or other actors to steer communities, countries, or groups of countries in the pursuit of health as integral to wellbeing through both a whole-of-government and a whole-of-society approach’ (WHO, 2011, p.4).

In this thesis, I also investigate issues related to risk management of activities associated with Bombana gold mining. In mining industries, risk management is an essential component of Safety and Health Management Systems (SHMS). Risk management techniques focus on critical controls and the effectiveness of those controls for health risks and occupational health issues (Cliff, Harris, Bofinger and Lynas, 2017, p.296).

Risk management has elements of risk communication issues, evident in the Bombana mining industry. Risk communication has a broad scope and can include product warning

labels, interactions among government officials, industry officers, media and public opinion (Covello, Von-Winterfeld and Slovic in Travis, 1988, p.163).

I employ anthropological theories of risks to understand the dynamics of health governance and risk management activities in relation to Bombana gold mining. I refer to the cultural risk theory in chapter one (Boholm, 1996; 1998; 2003; 2006; Douglas and Wildavsky, 1982) to explain this anthropology of risks. This cultural risk anthropology theory assists my analysis to explain how culturally and socially embedded knowledge and experience influence risk perception, communication and management in the community. I focus on how anthropological risk theory relates to health governance, managerial anthropology, and occupational health anthropology.

I principally interviewed government officials for this chapter, comparing levels of knowledge and actions at different levels of government. I used interviews with people in the community to further understand the community government interactions.

Firstly, I will consider health governance, i.e. the management of environmental health issues in the community as practised by government agencies such as the Bombana Health District Department (*Dinas Kesehatan/Dinkes*), the Environmental Agency (*Badan Lingkungan Hidup/BLH*) and the police department. I will examine how police officers regulate risk-taking behaviours by looking closely at a local program to combat social problems in the community, called *Operasi Penyakit Masyarakat (Operasi Pekat)*.

Secondly, I review the efforts of NGOs to support local governments in dealing with the risks of mining. Then I explain mining companies' risk management roles, including Health and Safety Management Systems (HSMS). Finally, I explain the promotion of the health risks of mining by mass media as an example of risk communication.

Health Governance: Local Government Agencies and Police Officers

This section will start with health governance practices conducted by all related agencies in Bombana—including government, public and private agencies, to maintain the risks of gold mining activities. The aspects of health governance cover curative, preventive, health promotion, and health policies. I also investigate the political dynamics related to health governance at the village, district, and provincial levels. As Gross (2013, p. 1) highlights, governance in health care and health services resembles a two-sided coin in that both sides cannot be separated from one another. He also notes that healthcare governance involves other

organisations and professionals (Gross, 2013). In this subchapter, I explain the government agencies that play significant roles in governing the health risks of Bombana mining including *Dinkes*, *BLH*, the Department of Mining, Minerals and Energy (*Dinas Pertambangan, Mineral dan Energy*), and the police department.

Bombana Health District (*Dinas Kesehatan/Dinkes Bombana*): Health Services, Health Promotion and Health Policies

In the introduction, I reported Tarsan's observation that most Bombana people perceive health issues related to mining activities as the responsibility of the Bombana Health Department, *Dinkes*. The *Dinkes* is recognized as leading sector of health governance to address risk of Bombana gold mining. To explain the issues of health governance in the *Dinkes* institution, I investigated the *Dinkes*' formal health care services by looking at its structures, policies, health programs, professional organisations, and health providers.

The *Dinkes* holds what Foucault (1991) would characterise as vertical powers governing health services in Bombana areas. These powers include regulating staffing and programming and controlling programs at each level of health services. It includes the Technical Health Services (*Unit Pelaksana Teknis Daerah/UPTD*), and the Bombana Hospital, the highest local referral level, located in Rumbia city. The *Dinkes* also manages the Community Health Service units (*Pusat Kesehatan Masyarakat/ (Puskesmas)*) in every sub-district and community health posts (*Pusat Pelayanan Terpadu/Pustu*) at the village level.

The *Dinkes* initiated innovative healthcare programs during the gold rush in 2009-2010 (*Dinkes Bombana*, 2011). It created special health service programs and facilities for miners living and working near mining areas, aimed at responding to the increased demands on health services by the increase in miners, mostly migrant miners. According to Sukma, a village nurse based in Rau-rau village, when gold was first found, many people flocked to the mining site in Rau-Rau village, and the number of injuries and health issues increased. The Bombana District Health Department initiated a unique program called Health Post (*Pos Kesehatan*) to help the mining community amidst this initial chaos. Nurses were appointed to deliver health care services to the miners in this health post. As the number of miners declined, the health post was no longer needed, and the *Dinkes Bombana* closed it.

According to data from Health Profile of *Dinkes Bombana*, another innovative program from *Dinkes* was the Occupational Health Unit Program (*Unit Kesehatan Kerja/UKK*), which

was set up to address health issues experienced by miners starting from 2008 gold rush era. There was very poor coordination of health promotion programs on health and safety for miners in the Community Health Service units (*Puskesmas*) at the sub-district level and in the community health posts (*Pustu*) at the village level. Subsequently, the *Dinkes* handed over occupational health issues to the mining companies to deal with.

The funding available to provide services plays a vital role in health services. The health governance apparatus to support health services could not survive without financial support. Although the *Dinkes* created an innovative program such as *UKK*, it only survived for a short time due to a lack of ongoing funding. Tarsan, Head of Environmental Health at *Dinkes* Bombana, responsible for the *UKK* program, stated that this program could not continue because of its limited budget. Monitoring and reporting of diseases and accidents in mining sites were also discontinued due to lack of funding. The funding for the *UKK* program to address mining-related issues was stopped because health issues related to mining were no longer recognized as a priority issue with an additional budget. Now mining-related health issues are included in environmental health, epidemiology and health promotion programs.

The limited budget has subsequently limited health educational programs to enhance health professionals' knowledge and skills in managing the health risks of related Bombana mining activities. Most health professionals appointed to work on the front line of mining areas lack the specific skills and knowledge to understand the health impacts of mining on the community. They are unfamiliar with diagnosing or treating diseases arising from mining activities, as discussed in chapter four (diseases related to mercury contamination). Health professionals in Bombana admitted that they did not know about mercury and had not heard what diseases mercury can cause in humans or how to diagnose them, much less how to treat or manage them. *Puskesmas* staff admitted that they did not link mercury toxicity to skin diseases such as itchiness that most miners complained about (see chapter four regarding mercury and its effects). Indeed, influential groups—such as the mining companies that use much mercury in their gold processing—do not want health professionals to know about the negative impacts of mercury on Bombana people. During my fieldwork, I had an opportunity to facilitate training (Collaboration work of *Dinkes* Bombana, Haluoleo University, Bali Focus and AusAid/GPFD programme) for village nurses and midwives to giving them knowledge and skills on how to detect mercury contamination in the human body.

A program called the GPFM Mining for a Development project,²³ funded by Australian Aid (AusAid) and the Faculty of Public Health at Haluoleo University, initiated a program to investigate the impacts of mercury on human health. AusAid also funded a health-training program for health professionals in mining circles—'*Daerah linker tambang*'—to impart knowledge and skills to help them identify people affected by mercury. This training was followed by a health promotion program, which involved displaying banners to raise concern about the health risks of mercury.

The illegal status of migrant miners also impeded the efforts of the *Dinkes* to provide health services. The *Dinkes* did not establish health service facilities in the remote mining areas (see chapter 3 about the tent mining sites) because the Bombana government ignored the situation. Women and children who live in tent mining areas have experienced more difficulties from this situation. For example, pregnant women cannot access pregnancy health care and delivery services from midwives, and children cannot get children's health services (see chapters five and six).

Traditional beliefs and socio-cultural factors influenced how miners utilised the available health care and services provided by the *Dinkes*, including the *Pustu* and *Puskesmas*. Some miners preferred not to visit the health services due to socio-cultural barriers such as belief in traditional medical practices. They only consulted formal health services if they could not deal with their health problems through traditional healers (*dukun*). Miners visited the health services when they faced health problems that the *dukun* could not cure, such as diarrhoea, injuries, itchiness, and bleeding. Sukma, the village nurse of Rau-rau, informed me that an injured male miner first visited the *dukun* for a massage to heal his injury, and then came to her when his wounds or lesions were infected.

The high cost of services and transportation fees prevented miners from accessing health services and motivated them to self-medicate. Miners are able to buy medication from the *sembako* vendor, including medicine for headaches (*obat sakit kepala*), medicines for bloating (*obat masuk angin*), pain relief medication (*obat penghilang rasa sakit*), paracetamol for high temperature (*panas tinggi*), fever (*demam*), and antibiotics (ampicillin or amoxicillin). Transportation fees were very high due to poor road infrastructure and geographical conditions, such as dusty, slippery, and rough road conditions.

According to my observations, the policies and programs of the *Dinkes* and other public and private institutions that governed the environmental health risks of mining activities were

²³ <https://asm4d.wordpress.com/>

very weak and ineffectual. There needed to be more coordination between multi-government agencies, particularly between the Bombana Environmental Health Department (*BLH Bombana*) and *Dinkes Bombana*. Each institution focused only on its own programs and followed its own defined area of responsibility (job description: *Tugas pokok dan fungsi/Tupoksi*).



Figure 7.1 The Head of *Dinkes* (holding the microphone) raises issues about health governance during training for early detection of mercury toxicity for health professionals on 10 April 2015

According to Makmur, the Head of the Environmental Capacity Development and Environmental Impact Analysis (*Bidang Pengembangan Kapasitas Lingkungan dan Analisis Mengenai Dampak Lingkungan/AMDAL*) section of BLH Bombana, the Bombana BLH was only responsible for monitoring and surveying the condition of the physical environment and was not responsible for the health consequences of environmental factors. The central agency responsible for governing the health issues arising from the environment was the *Dinkes*. The *Dinkes*, meanwhile, was responsible for maintaining data on diseases resulting from environmental damage, such as water and air pollution, rather than maintaining good environmental conditions.

When I asked to check the data on diseases resulting from mining activities in the *Dinkes* Bombana, Tarsan, the Head of the Environmental Health section (*Kepala Seksi Kesehatan Lingkungan*), found it challenging to provide comprehensive data on diseases resulting from the impacts of Bombana mining activities. The *Dinkes* relied on the *Puskesmas* to gather the data, yet the *Puskesmas* treated patients who were miners as general patients. The Environmental Health section of *Dinkes* also gathered data from its equivalent sections in every *Puskesmas*. However, the *Puskesmas*' staff members did not take any action regarding the environmental issues/damages, such as large tailing holes, which are breeding grounds for mosquitos that can cause malaria or filariasis. They were more focused on health promotion and vector control for infectious diseases for which they received funding from the Ministry of Health than on the impacts of environmental damage due to mining activities, such as malaria and filariasis.



Figure 7.2 Nurses and midwives attended training in early diagnosis of mercury poisoning given by Bali Fokus, AusAid and the ANU scholar

The Environmental Agency of Bombana District (*Badan Lingkungan Hidup/BLH Bombana*): Environmental Issues and *AMDAL*

The Bombana Environmental Agency is called *Badan Lingkungan Hidup (BLH), Pemakaman dan Kebersihan Kabupaten Bombana* (Environment, Cemetery and Cleanliness agency of Bombana district). This agency is informally known as *BLH Bombana*. The primary responsibility of this institution is to govern, monitor, report, and take action on the environmental impacts of mining activities in Bombana. This has two sub-divisions, Environmental Resources Development (*Bidang Pengembangan Kapasitas Lingkungan*) and Environmental Impact Analysis (*Analisis Mengenai Dampak Lingkungan/AMDAL*). As the main body governing environmental issues in mining, including controlling environmental impacts, the *BLH Bombana* has vertical consulting relations with the Southeast Sulawesi Provincial *BLH* and the central government's Ministry of Environment and Forestry. The avenues for consultation occur through written progress reports and supervision. The *BLH Bombana* also manages a surveillance program to control the water quality around Bombana, particularly in areas around the mining sites. A laboratory unit is responsible for measuring the physical quality of water and monitoring hazardous contaminants, such as mercury.

The Central Environment Agency (*Badan Lingkungan Hidup Pusat/BLH Pusat*) governs mining industries to maintain Environmental Impact Analysis *AMDAL* on their mining activities based on several laws (Fendi and Mulya, 2016). Firstly, Indonesian Government Laws No. 4/2009 (*Undang-Undang Republik Indonesia Nomor 4 Tahun 2009*) concerning mineral and coal mining (*Tentang Pertambangan Mineral Dan Batu Bara*). Secondly, Indonesian Government Law No.32 of 2009 (*Undang-Undang Republik Indonesia Nomor 32 Tahun 2009*) concerning environmental protection and management (*Tentang Perlindungan Dan Pengelolaan Lingkungan Hidup*). Thirdly, the Regulation or decree of the State Minister of Environment of the Republic of Indonesia No.5 of 2012 (*Peraturan Menteri Negara Lingkungan Hidup Republik Indonesia Nomor 5 Tahun 2012*) concerning types of activities required to have environmental impact analysis and other interrelated regulations and literature related to mining law and environmental law with an emphasis on Environmental Impact Analysis (*AMDAL : Tentang Jenis Kegiatan Dan/Atau Kegiatan Yang Wajib Memiliki Analisis Mengenai Dampak Lingkungan Hidup, dan peraturan lain yang saling berkaitan serta literatur-literatur yang berkaitan dengan hukum pertambangan serta hukum lingkungan dengan menitikberatkan pada AMDAL*).

The *AMDAL* section of *BLH Bombana* requires all mining companies to have an *AMDAL Environmental Impact Analysis*—including the fieldwork plan (*Rencana Kerja Lapangan/RKL*) document and the field production plan (*Rencana Produksi Lapangan/RPL*) document—and to fulfil their responsibilities in the mining sites. According to Makmur, the head of *AMDAL* section of *BLH Bombana*, his boss, the head of *BLH Bombana* can make pending or revoke the mining production license for mining companies if they do not fulfil their responsibilities to renew their *AMDAL* documents annually. *BLH Bombana* regulates mining industries to write their own *AMDAL* documents, report and update it annually to the local government agencies (*BLH Bombana* and Department of Mining, Minerals and Energy). This subsequently self-regulate mining industries in maintaining environmental conditions in their mining areas.

However, mining companies are still required to review and implement their *AMDAL*. For instance, PT. SUN failed to fulfil its *AMDAL* regulations. The *BLH Bombana* staff informed me that the SUN's mining company did not want to back-fill holes in the ground in their concession areas; these posed potential risks for humans and organisms around Wumbubangka village. The community complained about the danger of large holes for people, particularly children who live around the extensive tailings holes. They also complained about mosquitos and that their cows sink into the holes. These complaints have forced *BLH Bombana* to raise those issues and notify the mining company through face-to-face meetings and warning letters. However, their efforts were not sufficient to direct PT. SUN to back-fill the open pits. *BLH* officers from the Southeast Sulawesi provincial office supported *BLH Bombana* and applied moral force through lobbying to the PT.SUN director to respond to people's concerns about the holes along the route between the SP2 settlement in Marga Jaya village and Wumbubangka village. The *BLH* Staff also informed the media to expose this matter in the newspaper. These efforts finally got results. Then, the mining company agreed to backfill those holes. When I visited the mining sites at the end of my fieldwork year, I saw excavators backfilling most holes.

Joy Glowing (*Gembira Berseri*)

The movement to build the Bombana district with God's (Allah SWT) blessing

Vision: To actualise sustainable and environmentally friendly development.

Missions:

1. To increase the staff's capacity to manage environmental quality.
2. To control and monitor the exploration, exploitation, and environmental impact to preserve the environment.
3. To improve the condition of the environment and make it healthier.
4. To create an environmentally aware community.
5. To establish funeral management and services for the community.
6. To establish a sense of security regarding the threat of fire.

Box. 7.1 The BLH's vision and strategies. *Gembira Berseri* (Joy Glowing)



Figure 7.3 The BLH's vision and strategies. *Gembira Berseri* (Joy Glowing). Gembira is the recent Bupati's program in Bombana

The *BLH* Bombana encountered problems in enforcing the *AMDAL* regulation. The main problem was that there needed to be more coordination or communication between the *BLH* Bombana and the Mining and Energy Department in order to enforce the law, as per the example of the tailing pits in the mining area to be backfilled by PT.SUN. When I met Pak Hery, a director of PT. SUN, I asked about the issue of backfilling. He explained that PT.SUN had paid reclamation fees (*dana reklamasi*) to the Bombana local government, represented by the Mining and Energy Department (*Dinas Pertambangan dan Energi*). This institution was listed as the organisation responsible for reclamation, including backfilling. However, after communication between the *BLH* Bombana, the mining company, and the Bombana Mining and Energy Department, the company ultimately had to complete the backfilling in the mining areas.

As part of *AMDAL* evaluation and monitoring, the *BLH* Bombana also focused its program on mercury issues in the mining areas. Pak Abdi, the Head of the Bombana Environmental Agency, revealed that his department had been monitoring mining activities involving mercury use across all the mining companies in Bombana. *BLH* Bombana staff also regularly monitored water quality around the mining areas. The agency funded a survey to analyse the health and environmental contamination of massive and uncontrolled mercury use in mining activities. This survey was conducted with the Haluoleo Environmental Research Centre (Trisnawaty, Emiyarti and Afu, 2013) and found mercury contamination at the Tahi Ite River in Rau-Rau village. Abdi said that his department (*BLH* Bombana) would address the mercury issues depending on the budget and the priorities of the Head of the Bombana district (*Bupati*) and national concerns. There is much apprehension regarding the effects of mercury contamination around Bombana (as explained in chapter four about mercury).

A discrepancy between knowledge and behaviour among the *BLH* Bombana staff members has played a significant part in enforcing the laws to prevent environmental damage, including the risks of mercury on the environment, on humans and other living creatures. Two *BLH* officers (see Chapter Four on mercury) expressed their concerns about mercury to me: one stated, ‘mercury is categorised as dangerous goods (*bahan berbahaya dan beracun/B3*) for people’. Makmur, the Head of *AMDAL*, also raised his concerns regarding mercury pollution—and its potential health risks for the community—through the local newspaper.²⁴

²⁴ The *Kendari Post* headlined the news that mercury had contaminated water around Wumbubangka village and that this will threaten Bombana society.

Although Makmur and other *BLH* staff members disclosed their concerns about the harmful effects of mercury, they had little knowledge about the adverse risks of mercury on human health. Indeed, they also implied that mercury was safe for physical contact by humans, and *BLH* staff members touched or stirred mercury in a bowl with their bare hands during our visit to the mining sites (see Chapter Four). This highlights that knowledge does not always govern people to avoid mercury. This indicated that people hold divergent views and are exposed to contradictory information about mercury: it is neither of great public concern nor a cultural concern for the community (Douglas, 1966).

The *BLH* Bombana also holds the power to lodge complaints to the relevant institutions—particularly the police—regarding criminal actions affecting the environment, including using illegal substances. According to Makmur, the head of the *AMDAL* section, the *BLH* Bombana has actively enforced the mining laws²⁵ related to ‘the crime of environmental pollution’ (*kejahatan pencemaran lingkungan*) such as mercury use by mining companies. However, the police can only process the report if the *BLH* Bombana formally reports the crime to the police by lodging the formal articles regarding the environmental breach of laws and categorised as environmental crimes. The police institution cannot arrest miners who use mercury as environmental criminals if the *BLH* Bombana officer does not lodge formal complaints.

The Police Officer: Managing Risky Behaviours and the Social Problems Policy (*Operasi Penyakit Masyarakat/Operasi Pekat* or *Pekat* operation)

The police office is the leading authority to act on security issues in the Bombana mining community. After the gold rush in 2008, the police started to enforce laws and policies and regulate morality, security, and risky behaviours that could harm the miners and the community around mining sites (see chapter two).

Dedi, the Head of the Centre for Public Order and Safety Development (*Kepala Balai Bina Keamanan dan Ketertiban Masyarakat/Babinkamtibmas*) of Kasipute sub-district told me he used to supervise miners at the request of mining companies. He had also joined an operation to combat social problems (*Operasi Penyakit Masyarakat/Operasi Pekat* or *Pekat* operation) several times in the Bombana mining areas. He and his police colleagues used the *Pekat*

²⁵ Mukid is a police officer who was responsible for the surveillance of criminals in relation to the use of illegal substances, including mercury, which is widely used in Bombana mining.

operation to address any efforts by the police to manage risk-taking behaviours across Bombana mining communities, such as prostitution (*prostitusi*), fighting (*perkelahian*) and riots (*tawuran*) at the mining sites. The Head of the Centre stated that the *Pekat operation* had positive impacts and slowed down the escalating number of criminal actions in the Bombana community during the gold rush period.

I also obtained information regarding the *Pekat operation* from Mukid, the Head of the Centre for Public Order and Safety Development (*The Balai Bina Keamanan dan Ketertiban Masyarakat/Babinkamtibmas*) the Bombana Police office. He revealed that local police conduct regular *Pekat operations* in the community, targeting the main issues such as gambling (*judi*), drugs/narcotics (*narkotika dan obat terlarang/Narkoba*), drinking alcohol (*minuman keras/Miras*), and dangerous weapons (*senjata tajam/Sajam*). They also target social problems at the mining sites — “community diseases” (*penyakit masyarakat*)—related to risky behaviours, such as alcohol consumption, gambling, cockfighting, prostitution, and drug use. These problems have created community concerns in Bombana. Since the *Pekat operation* commenced, the local government and police around the mining areas have not allowed any form of prostitution. Mukid added that all community members are responsible for reporting any prostitution and that the police must arrest people engaging in prostitution and sever the circle of prostitution activities. From his perspective, police officers, local government, and community members should monitor those risky behaviours because they could provoke violence, even killing. Prostitution could also spread HIV/AIDS and other STDs. He explained that the *Pekat operation* had been implemented in 2009 and had positive impacts in reducing the number of criminals in the Bombana mining community. The *Pekat operation* was ongoing during my fieldwork visits.

Mukid also voiced a strong message for the Bombana local government, urging them to support the police in their fight against drug users in the Bombana district, particularly in the mining areas. The Bombana local government should allocate financial support in its planning and work with the National Narcotics Agency (*Badan Narkotika Nasional*) to run programs to combat drug abuse (*Narkoba*) in mining areas. He added that the central government should also establish a local court located in the Bombana area, not another district. This would allow police to process any criminal cases in Bombana instead of having to go to the high court in the Buton district, far from Bombana. This could save money and time and increase the authorities’ coverage of drug user control and supervision.

Regarding legal enforcement of the ban on alcohol, the Bombana government has issued a local regulation (*Peraturan Daerah/Perda*) to support the *Pekat operation*. There is no

Perda regarding alcohol use as there have been in other districts. The Bombana government had adopted Indonesian Presidential Decree No. 3 of 1997 (Keputusan Presiden/Kepres No.3 Tahun 1997), on the supervision and control of alcoholic beverages (*Tentang Pengawasan dan Pengendalian Minuman Beralkohol*) and alcohol consumption. However, this regulation was cancelled on 18 June 2013, and the Indonesian Government and People Representatives (*Dewan Perwakilan Rakyat/DPR*) replaced it with Law No. 42 P/HUM/2012, which ordered every regional area to promulgate its law on alcohol.

Felisiani (2013) reported a huge demonstration from the public in *Bundaran Hotel Indonesia* demanding the Indonesian central government establish a national law to ban alcoholic beverages. Following this, Yusril Ihza Mahendra, an Indonesian law expert, states:

‘The central government must set up fundamental rules [and] principles. The regional government should govern its authority later concerning the classification of alcoholic liquor, its production, sales, and distribution, and there should be a statement of goods under supervision’ (Felisiani, 2013).

A regional law governing the supervision and control of alcoholic beverages in Southeast Sulawesi, including the Bombana area, has not been established by the House of Representatives at the regional level. As a result, since 2014, there has been rampant alcohol abuse in the Bombana area, with alcohol traded freely in local stores and food stalls. However, Bombana society stigmatises those who consume alcohol as bad people. According to most Muslim miners, people who consume alcohol are immoral. This is because drinking alcohol is forbidden, and alcohol abuse is *haram* (forbidden) among Moslems, as stated in the Quran (Al-Qaradawi, 1999; Michalak & Trocki, 2006).

Most miners knew that the *Pekat* operation was a public policy mechanism implemented by the police to tackle and minimise risky behaviour—directly and indirectly from mining activities—that could harm human health. Some miners, particularly those living in the mining areas in the outskirts of the villages, said they were familiar with the issues linked to social problems operations (*Pekat operation*), conducted by the police. Miners and community members in Bombana avoided dealing with the police after the enforcement policy regarding the *Pekat operation*,

I argue that the *Pekat operation*, applied to combat social and community problems in the Bombana community, can be viewed as a regulatory model of power exerted through observation and other control mechanisms, an example of Foucault’s panopticon theory of modern control (Foucault, 1977).

Mining Companies Where Risks are Your Own Responsibility ('*Resiko Ditanggung Sendiri-Sendiri*'): Risk Management, Occupational Health and Safety

Mining companies operating in the Bombana mining area have risk management systems to manage mining activities' health and social impacts. Risk management in mining operations includes conducting occupational safety and health training, and should incorporate policies, procedures, and practices for hazard identification, hazards consequences assessment, risk levels (quantitatively and qualitatively) estimation, assessment of risk level against relevant criteria and objectives; and the decisions making to minimise the identified risks (Komljenovic and Kecojevic, 2007. P.622).

All mining companies in Bombana mining have policies and procedures regulating the employers and employees who legally working for the company and are directly paid by them. Some mining companies, such as PT. PLM also regulate their *Mitra*²⁶ or sub-contractors' health and well-being. However, most mining companies I observed across Bombana, such as PT Tiram and PT. Dinasti did not include their sub-contractors (*mitra*) in their health risk responsibilities.

When I visited the Dynasty mining company, the head of the company said that Dynasty were not responsible for *Mitra* workers who are injured in the mining areas. He added that they are responsible for their own risk management (*Resiko tanggung sendiri-sendiri*). In theory, the company should not allow people other than *Mitra* staff to work in the mining area; however, I observed many children, and some were allowed to mine in the Dynasty company concession area.

Mr Andi Rizal, the operational manager of PT. Tiran admitted that while his company has standards and procedures for the health and safety of workers and trains its workers (*karyawan*), it does not train the *dompeng* operators from their *Mitra* on how to work safely in the mining areas. His company has minimal facilities for health and work safety. It also lacks a human resources section to manage workplace health and safety. He added that the company is not responsible for all miners injured in mining work in the concession areas. Instead, the

²⁶ *Mitra* refers to miners who have a written agreement with the mining companies to mine in the designated mining areas, and those *mitra* will have a share with the mining companies according to the agreement (see Pidani, 2018)

company has only a general responsibility, as mentioned in the mining business licence (*Izin Usaha Penambangan/IUP*) given by the government, stating that companies' officers are expected to supervise people mining in their concession areas but are not responsible them. He argued that the boss of their *mitra* who was also a sub-contractor would look after the workers. On another occasion, I asked one of the bosses and *dompeng* owners about his responsibility for his workers; he admitted that it depends on the agreement with the workers. Most company owners are responsible for the workers regarding job-related accidents. However, this responsibility does not apply to people panning (*pending*) in their tailings holes because they are not officially considered workers.

Another company, PT. PLM, located in Wumbubangka village, has strict workplace health and safety procedures. The first time I visited the company, I had to pass through two main gates to reach the primary office. At the first gate, a security guard stopped me from entering until he received permission from his boss, who he called on a walkie-talkie. The security guard explained that for health and safety reasons everyone who entered the mining area had to be monitored. When I arrived at the front yard of the office, I saw a huge wooden banner, with 'Health and Safety Procedures' written on it, located in the left corner of the yard. When I entered the building, I also noticed small plastic banners placed along the corridors to the meeting office that emphasised 'Work Health and Safety' and a first aid box installed on the walls. I saw personal protection equipment, including helmets and boots, on the bench at the front desk. Many signs reminding miners to be healthy and safe at work were fixed on the walls. The geologist coordinator, Pak Andi Arung, took me to his office and asked me to wear boots and a white helmet before we embarked on a tour of mining areas. Most employees in the company office—including geologists, surveyors, and security guards—wore helmets and boots. However, I also observed miners who were considered *mitra* (Pidani, 2017) or *dompeng* employees (*karyawan dumping*) and their bosses, who did not wear boots or helmets. Most *mitra* (Pidani, 2017) employees worked barefoot, without sandals or shoes.

Every company has its regulations for managing the health and well-being of its workers. There are no consistent or uniform health and safety procedures that apply across all companies the same way. Most mining companies make little effort to deal with health risks arising from their activities. Indeed, generally, mining companies in Bombana do not accept full responsibility for miners working in their mining sites' concession areas. Moreover, mining companies do not have written enterprise agreements with their employees regarding the dangers they face while working; they accept only a moral responsibility. Miners manage injuries in mining sites by themselves. Miners listed as 'company staff' with written job

contracts have a right to obtain medical treatment if injured at work. They might be concerned about supervising people who come to work in the mines, yet their supervision has become more flexible as the amount of gold in these mining sites is believed to have decreased over the last two years.

Child labour issues, including their health and safety across the mining companies, have yet to be fully addressed (see Chapter Six on children). However, I heard from some mining companies' officers—such as the head of PT. Dinasti—that although companies acknowledged restrictions on the presence of children in mining sites, the enforcement of the regulations still does not exist. The strict regulations regarding the involvement of children in mining activities in Bombana, are not enforced by the central or local governments or by the mining companies. This will subsequently have negative impacts on children's health and safety. Other factors contributing to these negative impacts on the holistic development of children who work and play around mining areas are families' socio-cultural backgrounds, beliefs, and environments (see chapter six).

10 Mandatory Rules
PT. Panca Logam Makmur

1. Go to the workplace in good health and have enough rest.
2. Wear personal protective equipment.
3. Identify hazards before work.
4. Repair and report hazards in the workplace
5. Perform inspections and operations on machinery, equipment and vehicles.
6. Obey the supervisor's orders and work according to the work procedures.
7. Do not run machinery, equipment, and vehicles without permission.
8. Perform bundling and labelling of parts/machines during the process of repairs.
9. Report any accidents, even minor accidents.
10. Attend the OHS meeting and training as scheduled.

Box. 7.2 The ten mandatory rules of PT.PLM



Figure 7.4 The billboard that stands in front of the PLM office highlights issues of occupational health and safety (*Kesehatan dan Keselamatan Kerja/K3*)

Risk Communication: Mass Media, Professionals, Non-Governmental Organisations/NGOs and AusAID

In this section, I will explore the risk communication dynamic influenced by socio-cultural factors in Bombana mining sites. Risk communicators include experts or officials who deliver messages to the public, politicians, or news media about risks and potential dangers associated with industries (Covello, Von-Winterfeldt & Slovic, 1988; Wolfe, 1988, p.3; Boholm, 2008).

The local mass media played a significant role in announcing the new era of Bombana gold mining at the national level and precipitating the gold rush that brought hundreds of

thousands of people into Bombana. Online media at the national and local level includes *suarakendari.com*, *beritalingkungan.com*, *mongabay.co.id*, *wartaekonomi.com*, *kompas.com*, *liputan6.com*, and *m3sultra.wordpress.com*. The locally printed newspapers—*Kendari Pos* and *Kendari Express*—(Dar, 2015; Ashari, 2014; Zonasultra, 2015,) have also been chronicling mining issues in Bombana.

The mass media, both online and printed, has played a critical role in promoting issues of health risks and other issues linked to mining activities in Bombana. Dar, one of the journalists, informed me that his role is to collect as much information as possible and publish it on *Kendari News Online*. The mass media is also employed as a tool of social control to persuade mining companies to carry out regulations issued by the government at the local, provincial, and national levels. Makmur, a *BLH* officer, admitted that he used the mass media to pressure mining companies to follow the regulations and rules that *BLH* has applied to all mining companies operating in Bombana.

One of the national NGOs, Mining Advocacy Network (*Jaringan Advokasi Tambang/Jatam*)—which has a branch in Bombana—has acted as a leading local NGO that regulates and communicates all issues regarding Bombana mining. This organisation monitors the health effects of mining in Bombana and uses this information to conducting many advocacy efforts with government bodies, miners, and mining companies. During my research, I met with Sahrul, the head of *Jatam*'s Bombana branch. He claimed that this organisation only advocated issues with local government, raising concerns through local media but not addressing the needs of individuals or the community; for example, informing people about the risks of mercury and addressing problems in the mining sector, such as safe mining. He argued that there is an urgent need for such actions and interventions for people involved in Bombana mining. He hoped that Bombana could be regarded as a mining city (*kota tambang*) that is environmentally friendly (*ramah lingkungan*).

International media and photographers (Price, 2015), health professionals, and scientists from national and international NGOs (Bali Focus and Medicus Foundation, 2015) funded by the Australian Aid-funded Artisanal Mining for Development in Eastern Indonesia Project,²⁷ have also disseminated information to the community about the risks associated with mining. They portrayed how mercury toxicity resulting from the gold mining activities in Bombana has negative impacts on children's life (see chapter four about mercury).

²⁷ <https://asm4d.wordpress.com/>

The collaboration between outsider donors, outsider NGOs, and local NGOs is essential to support the survival of health programs funded, for instance, by overseas benefactors to address the risks of gold mining in Bombana. Outsider NGOs and donors can exchange information, knowledge and skills with local NGOs. The local NGOs can actively continue the outsider-initiated work by supporting miners in the Bombana community to ensure they are mining safely. For instance, the GPFD AusAid project has employed an information technology program called Frontline SMS to randomly circulate health promotion messages related mercury and mining risks that would easily reach most people in Bombana.

Conclusion

This chapter covers broad aspects of health governance, risk management and risk communication to minimise the negative health impacts of Bombana mining activities on humans and the environment.

There are three leading local government agencies, including, *Dinkes*, *BLH*, and Police, that maintain health governance in the Bombana community. These government institutions have worked collaboratively with the Mining and Energy Department, mining industries, and other community stakeholders to implement good health governance. However, the fact is that those institutions lack authority or motivation to enforce regulations that are in place as Tarsan mentioned ‘going independently’ (*jalan sendiri-sendiri*). There is a call for all related government agencies and stakeholders in the community to form a local organization to maintain the health governance issues in Bombana. WHO (2011, p. 6) suggested that governance for health promotes joint actions by health and non-health sectors, public and private actors, and citizens toward a common interest.

‘It requires a synergistic set of policies, many of which reside in sectors other than health and outside government, which must be supported by structures and mechanisms that enable collaboration’ (WHO, 2011, p. 8).

The head of *Dinkes* Bombana raised the issue of health governance, which requires collaborative, communicative, and integrated efforts from all related institutions. In April 2015, the head of *Dinkes* delivered a speech in the Training Program funded by the GPFD AusAid

Mining for a Development project.²⁸ He argued that *Dinkes* is one of many institutions that should deal with mining risks. Still, instead, all parties in the community should participate in tackling the health problems related to gold mining in Bombana. He was optimistic that *Dinkes* could minimise the health problems resulting from direct and indirect mining activities in good time and use tactical strategies with help from all stakeholders in the community. He said that the Bombana district government (*Pemerintah daerah/Pemda Bombana*) has a program called Joyful Village (*Gembira Desa*) to support community health programs by giving financial support to the cadres who help the health professionals in the community health post *Pustu*. At the end of his speech, Mr. Udin thanked AusAid, whom he considered outside donors, for helping *Dinkes* to empower health professionals by conducting such training. He called for the participation of all people—both individuals and organisations—in any possible ways to manage the risks of mining activities in Bombana. This is related to Spiegel (2012, p. 189) who advised that the Indonesian government should maintain good governance institutions to manage small-scale mining in rural areas.

Several months later, Bombana district government responded to this call and established an integrated system to maintain a good health governance model to manage the impacts of mining on the community. Makmur, the head of Environment Impact Analysis (*AMDAL*) section, *BLH* Bombana informed me that the Bombana government, along with local senators and stakeholders, have had several meetings to form this collaborative local organization called a cross-program organisation (*organisation lintas program*). The organization has its structure led by the head of Bombana district (*Bupati Bombana*) and the head of the local senate (*Ketua Dewan Perwakilan Rakyat/DPR*). This organization includes members from related institutions such as the Department of Mining and Energy, *BLH* Bombana, *Dinkes* Bombana, and community leaders. This is a positive sign that the Bombana local government has empowered all related government and non-government agencies, stakeholders, and media to maintain good governance to manage the impact of Bombana gold mining activities. In addition, to strengthen the efforts for health governance, every agency in the community needs to consider the social and cultural factors of the Bombana community. Indeed, good governance strategies to manage the health impacts should include good risk management managed by every mining company.

²⁸ I was given the honour to manage two days' training for these health professionals, in particular midwives who are considered the front line actors to deal with the negative health risks resulting from mining activities. The training, entitled GPF, was funded by AusAid.

Mining companies in Bombana are required by law to have risk management strategies put in place before implementing mining activities in Bombana. For example, the mining companies must maintain and fulfil their obligations listed in their Environmental Impact Analysis /*AMDAL* documents. They must also maintain Occupational Health and Safety in place during mining operations. However, in spite of these requirements, I found that risk management strategies did not adequately protect those people who work with mining companies collaboratively through *mitra* patronage. In fact, for these people the management of risk is up to them, (*resiko tanggung sendiri-sendiri, lit. on your own*). Employees do not have explicit enterprise agreements about their obligation and rights before working in the mining sector. This phenomenon should be addressed with good risk communication intersections at the local level.

Both local printed and online media have highlighted the issues of environmental degradation resulting from gold mining in Bombana with news headlines and propaganda. Some international donors, NGOs and journalists as outsider actors also have played essential roles in controlling the social and health impacts of Bombana mining. They have been raising concerns about mining activities and their potential negative impacts on the environment and humans. Risk communication in Bombana has successfully supported a reasonable health governance effort that will subsequently address the adverse health impact of Bombana gold mining. Maintaining good risk communication will impact on good risk management and health governance (Covello, Von-Winterfeldt & Slovic, 1988; Wolfe, 1988, p.3; Boholm, 2008).

In the next chapter, I will summarise my explanation in conclusion about the anthropology of risk perception, risk management and risk communication.

Chapter Eight

Conclusion: Ethnography of Health Risks of Bombana Gold Mining

My ethnographic study of health risks in small-scale mining in Bombana has investigated the following topics: the reasons people engage in risky mining activities; mining methods; risk perception in mining activities; and strategies for ameliorating these risks. My general study has examined how social structures, gender relations, customs, culture, religious beliefs, and values have influenced these.

Research subjects included officials from relevant government organisation such as Public Health Department (*Dinas Kesehatan/Dinkes*), Environmental agency (*Badan Lingkungan Hidup/BLH*), Mining and Energy Department (*Dinas Pertambangan dan Energi/Distamben*); stakeholders including local NGOs such as Mining Advocacy Network (*Jaringan Advokasi Tambang/Jatam*); and local people and miners in the field. In addition, I conducted field observations on a daily basis.

Mining Practices and Motivation of Sustenance (*Rezeki*)

Mining in Bombana can be categorised as small-scale: using panning, sluice boxes (*kato*), *dompeng* machines, and jet machines. Migrant miners and local miners exchange their mining skills and working cultures.

During my one-and-a-half-year ethnographic study in Bombana, I observed that most people working at Bombana mining sites were individually motivated by *rezeki* (*mencari rezeki*). (See chapter two ‘The *rezeki* from God’.) Despite the severe negative impacts of mining on the Bombana community, such as environmental damage and mercury toxicity, people continued to engage in small-scale mining, which also has risks of personal injury.

As discussed in Chapter One, it is crucial to understand how the locals in Bombana use the words ‘*bala*’ when referring to risks, and ‘*rezeki*’ in relation to mining for gold. (See Chapter One, ‘Communicating *bala* and *rezeki*’.) One of the miners, Nardi, said, ‘We don’t think about the risks of harm or injury such as *bala*, we only think of how God (Allah) gives us *rezeki* of gold’. Nardi’s motivation to become a miner was to find *rezeki* to secure his

family's livelihood. At the same time, his strong belief that the risks, or dangers were up to God (Allah) is demonstrated by his submission to God in his perceptions of risks.

Several questions arise in this situation if we link his motivation to find *rezeki* and his perceptions regarding the risks associated with mining. Questions raised include: Has Nardi's motivation to find *rezeki* compromised his perception of the risks of the tunnel collapse, suffocation, and injury? Could Nardi's rationalisation of mining to find *rezeki* have dominated his thinking and thus weakened and compromised his awareness of the risky conditions? Is his motivation to mine, to achieve *rezeki* to sustain his livelihood under his submission to God, more substantial than his fear of tunnel collapse? Has his faith in God encouraged him to take significant risks to obtain more gold, such as working in a dangerous deep shaft?

It is apparent that the terminology of 'looking for *rezeki*' reflects Nardi's religious devoutness and submission to God. '*Rezeki*' has strongly motivated him and others in Bombana to participate in mining activities. He also believes that any harm or injury that occurs is due to his behaviour or omission of performing traditional rites. This is evidence that, for some of the miners, 'finding *rezeki*' reflects their cultural and religious, not purely economic, motives. Some miners believed that looking for *rezeki* in mining was in appreciation to God for providing the gold *rezeki*: they viewed their work as doing good deeds according to God's rules (*jihad*). Despite the harsh environmental conditions, living in the blue tent settlements, and pervasive social illnesses and diseases, miners continue to seek *rezeki* to sustain their livelihoods.

Most Bombana people, both local and migrant miners, have ignored the health risks of mining and instead placed their trust in God, who has bestowed on them the *rezeki* as destiny in the form of gold. The corollary is that Nardi and most Bombana people believe that in gaining *rezeki*, they also have to manage the risks (*bala*) themselves, through traditional practices. Most locals and migrants—who work in Bombana have been negotiating their cultural and religious values, norms, and morality in order to get the *rezeki* from mining activities while managing the *bala* (risks)

Cultural Risk Perception and *Bala*

Culturally Bombana people have constructed their perception of risks as *bala*. According to their knowledge, '*bala*' is both specific (injury or damage) and uncertain (risk).

They embrace the traditional dichotomous construction of illness and wellbeing, including the cause of disease/illness and the role of traditional healing.

Bombana's traditional culture underpins all aspects of community perceptions about the environment, public health issues and the health impact of mining activities. This is related to the theory of cultural risk (Douglas and Wildavsky, 1982, p. 7; Dake, 1991; 1992, p. 21, Boholm, 1996; 1998; 2003; Boholm & Corvellec, 2011), that risk perception is socially and culturally constructed. Bombana people have diverse perceptions regarding the health risks of gold mining. Those perceptions are embedded in an extensive set of cultural values: on the one hand, the positive cultural motivation to mine for *reziki* and, on the other hand, the negative impacts of *bala* as the primary opposing cultural concept denoting more significant injury, including health risks.

Perceptions of the concept of risk among Bombana locals diverge from the definition of health risks constructed by the World Health Organisation (WHO). The WHO defines a risk factor of health as

‘any attribute, characteristic or exposure of an individual that increases the likelihood of developing a disease or injury and some examples of the more important risk factors are underweight, unsafe sex, high blood pressure, tobacco and alcohol consumption, and unsafe water, sanitation and hygiene’ (WHO, 2002).

Although I rarely heard the word risk (*resiko*) when I spent time with people at mining sites during my fieldwork, to explain risk in this thesis, I gathered many forms of language, expression, or terminology regarding any unwanted conditions that emerged. The word that always came up relating to these risks was *bala*. The *bala* relates to negative consequences that upset the equilibrium of miners' physical, mental, and social status, as both individuals and a group of people living around mining sites. *Bala* also includes damage to organisms, environments, and habitats affecting the quality of life of human beings. The word *bala* also refers to physical consequences that directly affect people: accidents (*kecelakaan*) such as tunnel collapse (*tanah runtuh*) or falling into a vertical hole (*jatuh dalam lubang*) and any form of injury, including wounds (*luka-luka*) and bleeding (*berdarah*) that could lead to death (*mati*). The term *bala* also implies any disease or illness, such as diarrhoea (*berak-berak/diare*) or itchiness (*gatal-gatal*). People can suffer problems mentally and socially, such as stress, poverty, mental disorders and related issues, and lack of social acceptance. Most people also refer to *bala* as danger (*bahaya*) and bad luck (*sial*). Most miners and Bombana people revealed

that their perceptions of *bala* include illnesses or issues affecting the community (*penyakit masyarakat*), such as social problems and water pollution.

Bombana people, particularly miners, have defined as *bala* health risks that are both familiar and unusual to them. These risks can be considered public or personal, according to their collective consensus (Douglas, 1990; 1992, p. 30; 1997) and personal selection (Douglas and Wildavsky, 1982, p. 29). For instance, miners have recognised tunnel collapse as *bala* for the individual and the community, but not the toxic effects of mercury.

If the term *bala* is translated into public health terminology, it relates to health risks—not only to physical conditions but also psychological, mental, and social-related risks, such as risks to one's reputation—and financial and legal risks. Social problems related to risk-taking behaviours, such as gambling, alcohol abuse, drug abuse, and prostitution, are considered risky by the Bombana society.

The risks for individuals are determined by their modes of engagement with mining activities. For example, people who carry out panning activities are less likely to incur financial risks but are more likely to suffer from water-borne diseases. One case illustrating this is William, a *dompeng* boss who—despite having solid financial capital—is more exposed to financial risks that may lead to psychological risks. He invested much money in the *trommol* machine, which he expected would provide him with more money, but later regretted it because he did not make significant profits in mining. Other risks that he faced included theft and lack of security. William used his financial capital and cultural agency (Bourdieu, 1986) to manage the risks of his mining activities. In addition, to deal with the harsh conditions of mining, he also implemented good psychological risk management strategies, such as entertaining himself with cockfighting, fishing, and submission to God. He managed his cultural capital by allowing others to mine at his mining site.

My research advises that *bala*, a traditional cosmology of risk, is more likely to be determined by several factors: morality related to culture and religion; traditional amelioration through rites and ceremony; gendered risk perception; the embodiment of knowledge and ignorance; and socio-politics.

Morality Risks

I argue that these two terms, *rezeki* and *bala*, are moral concepts that have played significant roles in risk perception and scaffolding their strategies to manage broader public health risk issues arising from gold mining activities.

In Bombana society, *bala* is generally entangled with notions of uncleanness (Douglas, 1966, p. 7; Pedersen, 2002) because *bala* is considered as punishment for committing sins and transgressions (Douglas, 1966). To avoid *bala* and to maintain *rezeki*, the Bombana people—particularly miners—believe that they should maintain good morality and conduct ameliorative rituals according to traditional culture and religion.

The community of Bombana miners has employed moral standards as a cultural system (Csordas, 2013). Morality is defined by local culture and religion and is subjectively used by Bombana miners to judge adverse events, including unwanted conditions or negative impacts on the individual and community. All this is to maintain good revenue from mining activities. Bombana miners seek to avoid perceived dangers (*bala*) that threatened their revenue from mining activities by maintaining an ‘excellent moral compass’ (Kleinmann, 1999, p. 362). They also maintained good morals to gain more *rezeki*.

Various public health-related risk-taking behaviours are considered harmful or immoral in mining, for example gambling, prostitution, etc.. In addition, moral diseases that lead to punishment from God and invisible creatures such as *jinn*s and spirits are associated with *bala*. Miners associated gold mining with morality, *jinn*, and hot money. My research shows that these factors influence behaviour and how they perceive the health risks of mining.

Cultural cosmologies and religious values contribute to constructing moral concepts in Bombana society. Morality and religion fundamentally affect how people perceive the risks from the health impacts of Bombana mining. Most of the population in Bombana profess themselves as Muslim and thus likely to hold Islamic values. People perceive gold mining as a gift from God, as Mauss (1990) emphasised. In this context, Muslim people believe that gold is a gift from Allah. Among the Bombana people who embrace religion, gold and mining activities generally are known as *rezeki* from God. Given that the gold is *rezeki*, people engaged in various gold mining activities are recognised as performing virtuous deeds.

There is a strong link between morality and religion and the presence of children at Bombana mining sites (see chapter six). Bombana people always expect children to maintain good morality towards their parents, and their parents also carry the same obligation. Because parents have a moral obligation to keep their children with them as per God’s mandate, parents take their children with them to mining sites. Parents always expect their children to be reliant on them (Hodder, 2012, p. 10) and to maintain filial piety (*bakti/berbakti*) as (Kohlberg, 1969;

Lee, 1973; Ikels, 2004; Hashimoto and Ikels, 2005) argue that children to be dependent on parents for sustenance. Parents also enforce taboo cultural mechanisms involving *pamali* or *pemali* (shunning) and impose the label of *anak durhaka* (rebellious or sinful child). Maintaining good morality is the key factor that will influence people, particularly parents, when interpreting risks to children's health or development. Parents care more about their children's moral risks than physical risks.

Children's health risks are determined chiefly by their parental dependency. My research found that traditional child-bearing and child-rearing cultural practices are socio-cultural factors that can determine the children's health status in Bombana mining. Local cultural beliefs contribute to how parents and Bombana society perceive the impacts of mining on children's development. Consequently, parents decide what are risky or non-risky conditions affecting their children's physical, biological, social, psychological, and cultural development. Children mostly rely on parents, and parents can direct their children to stay close to them in mining sites. Parental dependencies also predict children's development and will impact the children's health status in general. Parents hold broad responsibilities over the educational choices for their children, determining the extent of their education, how their children will engage in mining, and what risks they will face while in mining areas.

Most parents in Bombana mining areas see risks that affect the health status of their children as natural events connected with *bala*. Indeed, the presence of children at mining sites has been regarded as a domestic affair rather than a public problem. Therefore, issues of child labour and the presence of children at Bombana mining sites are not seen by the Bombana community—including parents and local government—as essential issues that could jeopardise children's development or health status.

Risk Amelioration Strategies

To avoid, reduce, or remove *bala* from someone's life, people in Bombana society perform specific rituals to remove uncleanness and to achieve purity (Douglas, 1966, p. 7) according to Bombana's local culture and religions. Those rituals involve mediums, God, and unseen creatures such as *jinn*. One of the miners said: 'If we know the risk, we will manage it first [by traditional rituals], before going further.'

My study advises that to predict the health risks of Bombana mining activities, it is essential that all stakeholders are aware of the local cultural and religious values that influence

local perception and management of risk. Including the moral aspects of their risk perception in the discussion can add to our understanding of risk discourse in society (Douglas, 1985, p. 14; Jasanoff, 1998).

Around 85 per cent of people in the Bombana mining community seek traditional healers (*dukun*), particularly Moronene traditional healers, to cure their health problems, diseases, and illnesses before seeking help from professional medical practitioners (village nurses and doctors). Only 15 per cent of people admitted that they immediately see medical practitioners when they experience health-related issues. Most people also conduct traditional rituals such as *mooli*, *kilala*, *bilangari*, and *baca-baca* to avoid risks. They also make traditional calculations to avoid and reduce potential risks in their mining activities, such as *bilangari* and *kilala* (see Chapter Two). People may underestimate the risks of mining activities because they believe they can reduce the high risks involved in their work by performing risk prevention rituals (Pidani and Mokui, 2017).

Another way for miners to avoid *bala* is to carry out their cultural and religious obligations, such as praying or making invocations (*dua/berdoa*) to God during compulsory prayer time (*sholat*). Hadi, a Muslim miner, said that ‘risk is in God’s hands. So, pray to Allah, and He will keep you away from *bala*’. He also attributes his good luck and bad luck to God. This signifies his submission to fate—whether bad or good—and his God, demonstrating religious values. He believes God can remove or diminish *bala* or risks from his life. Consequently, religion and morality have merged in constructing risk perceptions within the Bombana community.

At the institutional level, Bombana’s local government has been a leading sector in ameliorating the risks related gold mining. The Bombana Health Department (*Dinkes Bombana*) and Bombana Environmental Agency (*Badan Lingkungan Hidup/BLH Bombana*) are two leading government agencies that work together with central government agencies and stakeholders from local, national, and international levels. Each of those government agencies have their own unique control techniques according to the organisation's duties, job descriptions, aims, and objectives. The health department (*Dinkes*) has been working to manage the health care services for miners. In contrast, the environmental agency (*BLH*) has implemented monitoring, evaluation, and problem-solving in relation to the environmental risks of Bombana mining. Each government agency has independently exercised its powers to manage the risks of gold mining activities.

In general, the Bombana local government succeeded in bringing all stakeholders to a local forum to establish a consortium with the aim of addressing the general risks and

specifically the health risks of mining activities in Bombana. The consortium will facilitate and connect all the stakeholders' actions and organise them within the health governance system according to theories of Dodgson, Lee and Drager, 2002, p. 6; WHO, 2016). Funded by an Australian aid (AusAid) project, the local government has initiated two meetings with the Head of the District (*Bupati*) and members of parliament to form an integrated team to manage issues arising from gold mining activities in Bombana.

Knowledge and Ignorance

Knowledge and ignorance contribute to how people perceive the health risks of Bombana mining. Anthropologists, epidemiologists, and other scholars interested in understanding the mining risks in Bombana should take into account local people's knowledge and language about risks. I agree with Gifford (1986) that the exact language of risks should be explored between the expert and the laypeople to map a shared understanding of risk. As explained above, in this thesis, I employed the Bombana community's traditional concept of risks, *bala*, to explain how Bombana people define risks according to their traditional perceptions. I argue that members of the Bombana community have their local knowledge and ideas about what is risky and what is not.

Apart from this knowledge, there is vast ignorance in the Bombana community regarding the health risks involved in mining, particularly in relation to mercury use. However, for people in Bombana, ignorance is an alternative strategy to survive in pursuing their livelihoods. The term ignorance encompasses both lack of knowledge and misconception of knowledge, for instance, information about substances such as mercury and its risks. This also relates to the misunderstandings of local terms, such as *air raksa*, *air keras*, and so on (see chapter four about mercury).

Bombana people, particularly miners, have developed the ultimate mental tool, an 'adaptive ignorance', to survive and sustain their livelihoods. This adaptive ignorance is used to filter the information using individual criteria of risks based on the morality of culture and religion. As a result, people will decide what is risky for them and what is not. For instance, although officers from the Environmental Agency office (*BLH*) know about the harmful risks of mercury, they chose to ignore this knowledge and decided to touch the mercury during our visit to Roko-roko mining sites (see chapter four).

The 'adaptive ignorance' phenomenon has influenced Bombana people to develop a range of perceptions, attitudes, beliefs, and behavioural responses to mercury and its potential

hazards or dangers. These various responses are also determined by people's knowledge, experiences, and contact with the object; additionally, they stem from cultural and religious values, upbringing, politics, and moral views (Douglas, 1966; Douglas and Wildavski, 1982; Douglas, 1992). Bombana locals and miners use 'adaptive ignorance' to deal with the health risks inherent in their work, despite making some efforts to minimise the risks through modification of the potential risks and avoidance of risks.

Gender and Gendered Risk Perceptions

The issue of gender difference is embedded in every chapter of this thesis. To understand the relationship between gender in Bombana mining and risk perceptions, I focused on the position of women in mining' (see chapter five). In order to present a deeper understanding of the risks inherent in mining work, I incorporated the concept of gender into my risk study. The process of risk investigation requires a multidimensional gendered method to reduce new gendered risks (Hannah-Moffat & O'Malley, p. 22). To understand gendered risk perception in Bombana society, I started with the explanation of gender issues in light of power relations (Robinson, 2014) that starts from women's position in the mining community, engagement in mining, family, and individual health issues. The discussion extended to specific issues such as gender relations and covered the topics of femininity and masculinity, adult cathexis concerns, economic dependence, and political and social relations.

Through mining activities, women in Bombana have acquired more independence and flexibility to assert their agency in terms of, for example, finance and marriage. The Bombana community recognises women who participate in mining as 'tough women', predominantly by local women (see Ibu Suri Cs story in chapter five). Their mining engagement exemplifies their capabilities to fulfil extraordinary roles beyond their ordinary child-bearing, child-rearing and household duties as housewives (*ibu rumah tangga*). Their involvement in mining also gives them the freedom to manage their own finances. They also carry more authority to decide on the mode of their relationships in marriage, such as initiating divorce (see chapter five about the adult cathexis stories).

Although material dependency gained from mining activities contributes to women's authority to dictate their family and marital lives, the income women earn from mining activities is conceived and treated according to societal norms (Leacock, 1978). Bombana is a patriarchal society (Brenner, 1999) which entails abiding by the Bombana *adat* (customary system), including primarily unwritten rules. The *adat* requires women to be responsible for

domestic duties, and they are not recognised as the breadwinner in a family even though they obtain money from mining activities. All the income women earn is recognised as subsidiary income instead of the primary income. The Bombana mining community believes that men are breadwinners and women are managers of the household who also manage their husbands' income. To juggle the demands of these paternalistic cultural values and their individual or family needs, women miners must juggle their mining activities with family duties.

From the view of gendered risk perception, women are more aware of the risks inherent in mining compared to men. Women carefully choose to perform mining activities with low risks to their bodies and domestic roles as mothers and wives. They preserved their femininity in the masculine mining areas by carefully choosing feminine mining practices, such as panning rather than digging holes. Women also maintain ritual *mabura*, putting cosmetic masks on their faces before going to mining sites to preserve their femininity in harsh masculine environments. Men, meanwhile, are more involved in challenging jobs with more significant risks. They choose to do more physical activities related to mining, such as being a rat hole digger (*penggali lubang tikus*) or *dompeng* crew member who operates heavy hoses to spray water. They also choose jobs that require higher skills, such as *dompeng* operators and mining supervisors. In addition to expressing masculinity through these risky and demanding jobs, they express themselves by putting tattoos on their bodies.

Women are thus discriminated against due to gendered taboos and customs and limits to participation in mining sites. I argue that such gendered taboos shape risk perceptions around women's involvement in mining. This gendered taboo also contributes to constructing women's participation in mining activities.

Slow Violence of Bombana Mining

Looking at the global concept of risks, my research suggests that the risks posed by Bombana mining can be categorised as 'slow violence', a concept introduced by Nixon (2009; 2011). He defines slow violence as delayed environmental and societal degradation; it takes time to see the impacts and their dissemination in society. Violence is not seen as actual or spectacular but has hidden and long-term/chronic risks for humans and the environment (Nixon, 2009). The slow violence of Bombana gold mining will negatively impact society and persist long after the gold rush. Slow violence in Bombana mining areas comes in many forms, most notably in the mercury contamination of consumed water and agricultural land.

Slow violence has always been interwoven with politics, laws, health governance, risk management and risk communication. Many laws and regulations have been politically settled to manage the risks of mining activities. For instance, the law and regulations regarding mercury use and trading—have caused uncertainty among the Bombana people that subsequently influence their use of mercury in the mining. However, mass media (local, national and international) have highlighted in headline news the issues at the Bombana mining sites that relate to the slow violence phenomenon.

In conclusion, this research has found that maintaining a good health governance model and a political system of managing risks (Douglas, 1966) can positively contribute to mitigating the slow violence of Bombana mining. New strategies for risk communication (Boholm, 2008, risk governance, and risk management (Boholm and Corvellec, 2011) should be culturally informed.

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