

Small-scale Mining Survey

Produced as part of the Sabajo ESIA report

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Golder Associates
Newmont Suriname

Produced by:



in association with



Siriusstraat 14, Elizabethshof
Paramaribo, Suriname
Tel: (597) 457885
www.social-solutions.net

Authors:

Marieke Heemskerk and Celine Duijves
E-mail: mheemskerk@yahoo.com
E-mail: celineduijves@hotmail.com

Reviewed by:

Golder Associates
Newmont Suriname Social Responsibility Team

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DISCLAIMER: The opinions expressed in this report correspond to the authors and do not necessarily reflect those of Golder, Newmont, or any other organizations involved in the Sabajo ESIA. The authors are responsible for all errors in translation and interpretation.

ABBREVIATIONS AND GLOSSARY

Abbreviations

Au	Gold
BR	Brazilian
CANARC	Canarc Resource Corp
CSW	Commercial Sex Worker
ESIA	Environmental and Social Impact Assessment
Est.	Estimated
GoS	Government of Suriname
GPS	Global Positioning System
g	Gram
Hg	Mercury
hr	Hour
Ibid.	Ibidem, as previous
IFC	International Finance Corporation
ILACO	Engineering firm ILACO Suriname N.V.
kg.	Kilogram
km.	Kilometer
LBMA	London Bullion Market Association
LBO	Lager Beroepsonderwijs (Lower Vocational Education)
NIMOS	Nationaal Instituut voor Milieu en Ontwikkeling Suriname (National Institute for Environment and Development)
OGS	Ordering Goudsector (Commission for Regulation of the Gold Sector)
SR	Social Responsibility
SRD	Suriname Dollar
SSM	Small-scale gold mining / small-scale gold miner
SUR	Suriname
USD	United States Dollar

Glossary

Base camp: The area and structures that have been created by Newmont to be able to perform its activities in the Sabajo area, including housing of its workers, administrative activities, and storage of geological samples.

Cabaret: Brothel in the SSM areas

Equipment owner: Person who is the boss of an SSM operation and owns the equipment of that operation. Often this person is regularly present in the area to lead the team(s) of workers, but he or she may put someone else in charge in the field. When there is a field manager in place, the equipment owner will typically decide on where to mine, where to buy supplies, and how to spend the earnings. One equipment owner may have multiple sets of equipment (e.g. two mills) in different locations.

Garimpeiro: Brazilian gold miner

Kapitein: Traditional authority of a Maroon or Indigenous community. Among the Maroons, this is typically the head of a clan.

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Kawina: The word “Kawina” literally means “Commewijne” (SUR), and as such refers to both a geographic area –the floodplain of the Commewijne River- and the people living in this area.

Kawina people or *Kawina Ndyuka*: In this report, we use the terms Kawina people or Kawina Ndyuka to refer to the inhabitants of the upper Commewijne area who trace their ancestry to the communities of Java, Pennenica (=Nengrekondrepere), Moismoiskonre (=Moengotapoe) and Gododrai (=Mapane). They are ethnically Ndyuka, with some mix with Indigenous peoples. When referring to other people who may consider themselves “Kawina”, this will be explicitly mentioned.

Land Boss: De facto concession owner, typically someone claiming traditional presence or customary rights in the area, to whom (a share of) SSM pay percentage payments.

Maroons: Tribal people of African descent. In Suriname, six different Maroon groups claim traditional rights to different territories in the country’s interior.

Mining operation: One or more sets of equipment with their workers and support staff (e.g. cook, excavator operator), who fall under the responsibility of one equipment owner in one general location.

Project Footprint: refers to 886 ha area that will be directly occupied by project.

Project concession area: The concession as a whole plus the length of the Merian-Sabajo haul road.

The Sabajo Project: All Sabajo/Santa Barbara/Margo mining areas plus the haul road to Merian

Sabajo: The right of exploration for gold and associated metals that was extended by decree of the Minister of Natural Resources (GMD no. 387/16) on June 7, 2016, for an area of 4,678 hectares for the period of 2 years.

Sranantongo: Suriname Creole language and lingua franca.

(SSM) service providers: individuals or businesses that deliver auxiliary services to gold miners in the mining area, but are not part of a mining team. Service providers include, for example, transport providers, Commercial Sex Workers (CSW), bar and brothel owners, and shop owners.

SSM Survey: Small-scale gold mining survey among gold miners working in and around the Sabajo project, as part of the Sabajo ESIA.

Small-scale gold mining (SSM): Mining for gold, practiced by individuals or groups of people who are not formally schooled in mining and use rudimentary techniques to locate and extract the gold. SSM as a livelihood activity typically takes place in low-income countries, where it is often but not necessarily part of the informal economy.

SSM Operation: a firm performing SSM activities in one location, and which is owned by one equipment owner or joint venture, with one shared budget. One SSM operation can own multiple pieces of mining equipment and have different teams of workers.

SSM Population: Equipment owners, their workers and SSM service providers in the Sabajo area.

SSM zone: Concentration of SSM within the larger Sabajo area. Santa Barbara and Margo would be considered two distinct mining zones.

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EXECUTIVE SUMMARY

This SSM survey provides a detailed description of SSM activities in and around the Sabajo Project proposed by Newmont Suriname. The Kawina Ndyuka received special attention in this SSM survey because they have historically lived in the Commewijne watershed area, and have a history of resource use along the Kleine Commewijne River and its tributaries, which traverse the Sabajo Project.

The Sabajo Project and surrounding areas have a long history of gold mining, going back to the 1880-1910 gold rush. Some of the Kawina SSM who are mining at Santa Barbara today, first arrived to the Sabajo general area in 1993. They left the area in 1995 because of the high costs of bringing in fuel and supplies. They returned in 2009, when access had improved due to newly developed logging roads. In the meantime, F¹ had established himself as a land boss in the area. Newmont Suriname obtained exploration rights to the Sabajo area in 2009.

In August 2017, the total number of persons performing SSM-related activities and/or living within the Sabajo concession area was about 200 individuals in the eighteen SSM operations identified. Twenty-one of these individuals were Kawina. The Kawina play a prominent role in the Sabajo SSM sector as equipment owners and land bosses, though some also work as regular laborers. The mining zone referred to as “Santa Barbara” hosts the largest share of SSM (~70%), and also the largest number of Kawina. About one third of the SSM population consists of Brazilian migrant SSM. One in every ten persons in the SSM population is a woman. Women are mostly active in the SSM service sector as CSM (commercial sex workers), cooks, and cabaret owners; or present as a spouse or relative.

The system of land bosses is a commonly accepted practice in SSM areas in Suriname and helps to informally regulate and govern these areas, though this practice is not legal under Suriname law. Land bosses can play an important role as SSM area managers. Land bosses are typically people who claim either formal (i.e. concession title) or informal (ancestral/tribal) rights to the land where SSM are active. The situation at the Sabajo Project is unusual because the main land boss cannot claim formal or informal rights. This land boss' status is based on being the first Surinamese person in Santa Barbara, claiming a non-verified concession title for the Santa Barbara flood plain area, and by bringing Brazilian equipment owners to the area who then became his personal protégées. The Kawina equipment owners, as traditional people of the Commewijne River area, do not pay or collect land boss money. Outside of the Santa Barbara area, SSM equipment owners do not pay land boss money to anyone because they: (a) are Kawina, (b) do not accept any land rights claim, or (c) have not yet been visited by someone claiming to be a land boss. The Kawina people as a community do not benefit from the collection of land boss fees.

Small-scale gold miners at Sabajo have highly mechanized operations. Of the 18 surveyed SSM operations, only one worked without the use of an excavator. Most operations own one or more excavators, but five operations rented one. Thirteen hammer mills and 14 sluicing systems were active at the time of fieldwork. All equipment owners reported the use of mercury. Consulted SSM equipment owners estimated the value of their machinery at between roughly USD 10,000 and USD 250,000 (average of USD 102,000). Fuel is the largest variable expense; interviewed operations burned an estimated 3-8 thousand liters of diesel per week. When working with an excavator, the workers receive 20 percent of earnings and the equipment owner takes 80 percent to cover the expenses. Average SSM earnings (for workers) were calculated at roughly 18 grams of gold per month (USD 570/month, if working six days a week; median: 15.3 g Au/month). Real earnings are probably about half of that

¹ Names of interviewees have been changed and are identified by in this report by letter, for example “F”.

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amount because SSM operations are frequently dysfunctional because of broken equipment, too much water or overburden, and other issues. SSM equipment owners typically pay for at least part of their equipment and variable expenses through credit and loans. For eight mining operations from whom data could be obtained, debts ranged from roughly USD 10,000 to USD 200,000 (avg. USD 63,000). With regard to services, four cabarets and one store were counted in the Sabajo general area. The four cabarets together hosted four Brazilian CSW (all in the cabaret along the road to camp) and nine Dominican CSW (all in Santa Barbara).

Food for the camps is typically obtained from Paramaribo. A couple of individuals reported hunting and fishing, and in many camps, people plant some basic food crops to supplement the diet. The majority of SSM operations obtained drinking water from a well, and others relied on rain and/or creek water. Most camps created some sort of sanitary facility in the forest – typically, a large hole with wooden beams across- and others relied on the forest floor. For medical services, interviewed SSM would go to Paramaribo or French Guiana. Virtually none of the interviewed SSM had health insurance. In order to protect themselves from violent assault and theft, some SSM operations have hired armed security services, either continuously or only on high risk days. Quoted expenses for such services ranged from USD 3,000-5,000/month, to 10 g Au (~ USD 320)/pp/day. The SSM have virtually no contact with the Afobaka communities. Also, in the past couple of years there has been hardly any contact with the Government of Suriname's Ordening Goudsector (OGS).

The results of this SSM survey must be considered a snapshot in time, depicting the situation of SSM in the Sabajo Project in mid-2017. SSM areas change continuously, as mining teams leave for (perceived) better opportunities elsewhere, new SSM teams arrive, new deposits are discovered, and old places are mined out. Some factors are not expected to change much in the near future. For example, mining methods in the Suriname SSM sector have remained relatively similar in the past 20 –or even in the past 120- years. Although some larger pieces of equipment have been added (e.g. excavators), working with simple gravity separation methods with sluices –and milling where necessary- is strikingly similar to past SSM techniques that have been used throughout the Americas. The ways that mining operations organize (socially and economically) was introduced by *garimpeiros* in the late 20th century, and is basically the same in all SSM areas. Also, the ways that SSM operations in Sabajo find drinking water, process their garbage, and build sanitary facilities is not likely to go through revolutionary changes in the coming couple of years.

Changes are to be expected in the number and location of SSM operations in the area, and were ongoing during the fieldwork period. It is important that Newmont, through its Security and Social Responsibility teams, keep track of these changes and maintain a log of when new teams arrive in the area and note who they are.

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1.0 INTRODUCTION

This document (“SSM Survey”) provides a detailed description of small-scale gold mining (SSM) activities in and around the Sabajo Project proposed by Newmont Suriname, LLC (“Newmont Suriname”). The SSM survey describes the history of SSM in the Sabajo area, present-day SSM population size and demographic background, equipment used, SSM economic management, land bosses and service providers, and existing relations between Newmont Suriname and the small-scale gold miners.

The Sabajo Gold Project (Sabajo) is located in Para district in the northeastern part of Suriname, 30 km west of Merian and about 20 km northeast of the Afobaka dam (Figure 1). Access to the site is through existing roads. The Sabajo Project proposes to develop and mine the Sabajo deposit as a satellite to the Merian operation and will only involve mining activities and the transport of ore via a haul road to the Merian mill, where the ore will be processed. This SSM survey is part of the Sabajo ESIA, which is planned to be submitted in March 2018 to the National Institute of Environment and Development (NIMOS) and interested stakeholders.

Newmont Suriname, as the project proponent, is responsible for the preparation of the ESIA, which is needed to evaluate the environmental, health and socioeconomic impacts of project-related activities during the construction and operation of the Sabajo Project. Golder Associates will lead the effort, and additional local Surinamese and international experts will support the baseline studies and the evaluation of potential impacts.

The Sabajo project is located in the Commewijne River watershed, in the triangle between the Bigi Anu Creek/Little Commewijne River and its tributary, the Tempati Creek (Figure 1). Interviews suggest that this general area has historically been used for resource extraction by people who refer to themselves as “Kawina”². The Kawina are an ethnically mixed group of mostly Ndyuka³ Maroons⁴, Indigenous People, and Creoles. Among people who call themselves “Kawina”, one can distinguish people from the lower Commewijne River –who are mostly Indigenous mixed with Creoles- and tribal Maroons who settled along the upper Commewijne River in the villages of Pennenica (=Negrekondrepere), Gododrai (also named: Mapane), Java, and Moismoiskondre (also named: Moengotapoe)⁵.

The upper Commewijne people are the descendants of a group of Ndyuka Maroons, who left the Cottica area⁶ in the early-19th century because they had discovered valuable wood species along the Commewijne River, which they wanted to exploit for the Paramaribo wood market (Thoden van Velzen, anthropologist and oral historian, pers. com. 17 Feb 2017)⁷. Post holder reports from the first half of the 19th century confirm the presence of Maroons

² Both Kawina traditional authorities and other Kawina individuals mentioned in focus groups and personal interviews that Kawina people, mostly men, historically used this general area for logging, fishing and hunting. During such trips, men built temporary shelters in the forest. One Kawina gold miner, Mr. Misiedjang, reported that his grandparents lived some years in a settlement (*kampu*) along the Bigi Anu creek (pers. com, R. Misidjang, 05-08-17). They called this place Lemiki bong (Lemon tree). Mr. Misidjang found it difficult to estimate the exact distance from this Santa Barbara, but estimated it at about 2-3 km. The family fished, hunted and planted in this location, but moved when their children grew older and they wanted to send them to school. Information about other families that settled in this area may be revealed in the land rights study. There is no evidence that there have been larger permanent villages in this area.

³ The Ndyuka Maroons are one of six Maroon groups in Suriname. They lived originally primarily along the Tapanahoni River, but also settled (in the 18th and 19th century) in the Saracreek, Cottica and Commewijne areas. “Kawina” means “Commewijne” in the Ndyuka Maroon language.

⁴ Maroons are descendants of runaway slaves who established independent settlements in the rainforest. The Maroons are considered tribal people, and have –like Indigenous peoples- their own governing systems, authorities and leadership structures, user areas, language, and culture – which can be clearly distinguished from that of other ethnic groups in Suriname. In Suriname there are six Maroon groups: the Ndyuka (or Aukaners), Saramaka, Paramaka, Kwinti, Matawai and Aluku (or Boni).

⁵ There does not seem to be a clear land mark that divides the upper Commewijne River area from the Lower Commewijne River. One respondent reported that everything from Gododrai southward is Upper Commewijne (Mr. Francis and Mr. Misiedjan, pers. com. 19/07/17). According to another respondent, everything down river from Cassiwina is lower Commewijne (Jopoi, gold equipment owner, pers. com. 031117).

⁶ The Cottica Ndyuka are a group of Ndyuka who left their traditional living areas along the Tapanahoni around 1800 to engage in commercial logging activities in the Cottica area (Thoden Van Velzen, anthropologist and oral historian, pers. Com. 25 Sept. 2017). A government representative in the area (“post holder”) who visited the Tapanahoni village of Mainsi in 1806 reports that almost all men had left the village to work in the coastal area. This was also the case in many other Ndyuka villages (ibid).

In 1846, Mr. Dhondt became post holder among the Ndyuka who lived in the Cottica area. The Hansu (or Ansu, clan) had moved to the Cottica before Dhondt’s time. Agitiondro was their principle village (De Groot, 1977: p. 48).

⁷ A 1850 map confirms that the area between the Small Commewijne and Tempati creeks is inhabited by black people (the map refers to “Neger gronden”) but does not specify who.

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in the upper Commewijne River area⁸. Records of slave names suggest that the ancestors of some Kawina families originate from Commewijne plantations, but the records do not reveal whether they were among the original Ndyuka settlers in the area (those who came from the Tapanahoni) or new runaways⁹. The Ndyuka in the Commewijne area (“Kawina Ndyuka”) mingled somewhat with Indigenous peoples, but maintained their traditional tribal structures and culture, and fall under the responsibility of the Ndyuka granman at the Tapanahoni.

In following pages, the SSM survey proceeds as follows:

Chapter 2 provides a description of the methods that have been used for data collection, as well as ethical considerations and limitations of the study. It also presents maps of the various locations where SSM operations are active and where SSM service providers are located around the Sabajo Project.

In **Chapter 3**, the results of social science data collection are presented. It discusses the land-use and mining history of the Sabajo area and the role of the Kawina people therein. It also discusses the size and demographics of SSM population; the system of land bosses; gender dynamics; SSM equipment; SSM economics; mercury use; access to services; and the current relationship between Newmont and the SSM population.

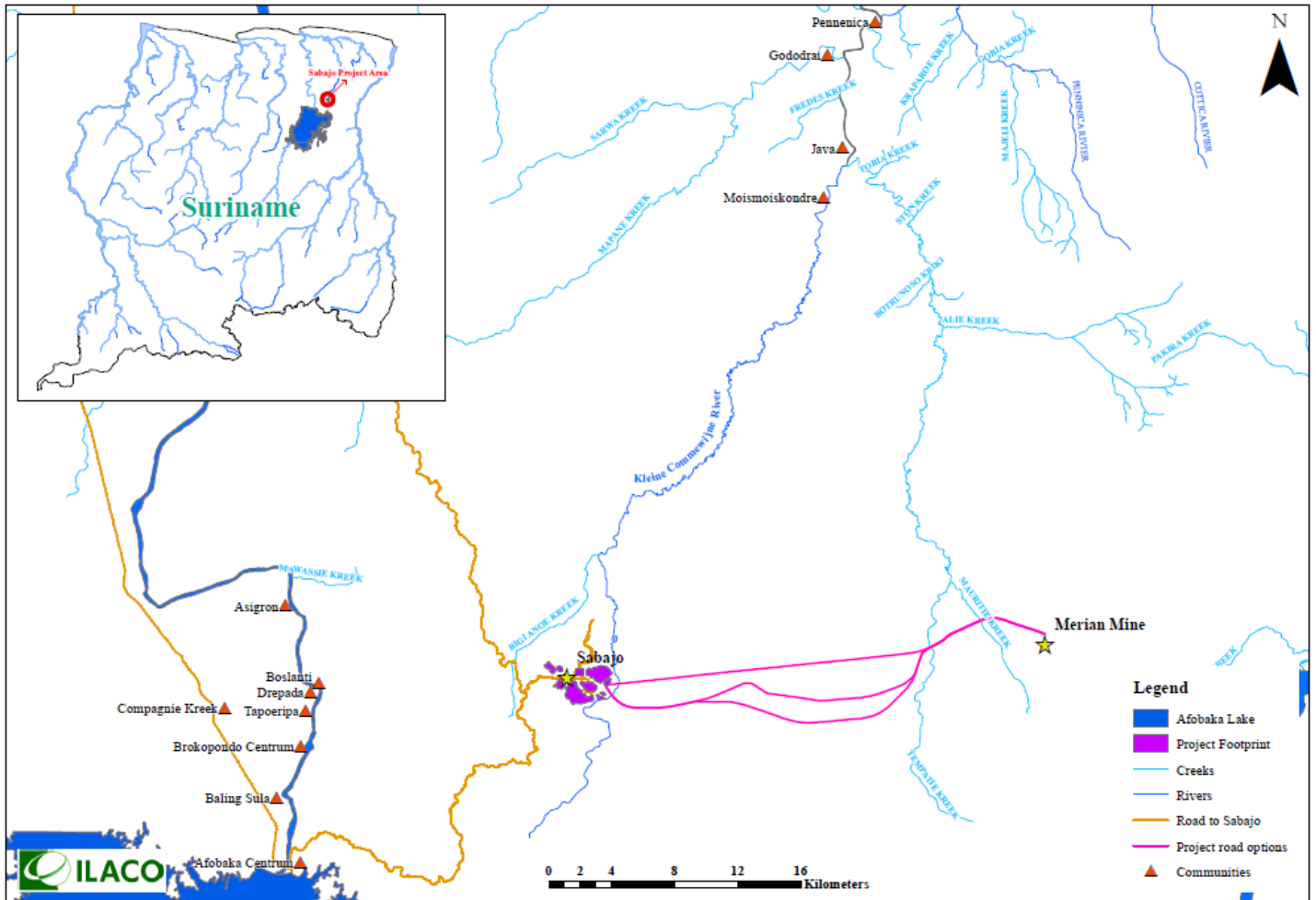
The **Conclusions** offers a final synthesis of the findings that are most relevant to Newmont for understanding the SSM sector in the Sabajo area.

⁸ After the peace treaties, the Maroons were allowed to live in the interior behind a certain point. Governmental post holders (*posthouders*) were installed to control the maroons traveling to the coastal area. Post holder Kappler reported that already prior to 1836, the Pamaka in settlements in the highlands on several hours distance from the Marowijne river, had made foot paths “so that they could stay in contact with the Maroons of the upper Commewijne area and with the Ndyuka (“waardoor zij in gemeenschap waren met de Boschnegers in de Boven Commewijne en met de Aucaner boschnegers.”) (Source: Landsarchief; Brievenboek 1872, Indianen en Boschnegers. “Over de Paramacca of Pramaca negers gevestigd nabij den oever der rivier (Hollandsche gedeelte), 12/1/1872”.

⁹ Slave records from plantations along the Commewijne river feature several typical Kawina family names, including “Noordzee” (upper Commewijne area, plantation Cannawapibo), and Grootfaam and Francis (Lower Commewijne area). Information about family names given to slaves, per plantation, van be found on the website: http://www.surinamistiek.nl/main/slavernijverleden/Familienamen_en_Plantages.pdf. See also website of Surinameplantages.com where one can search by family names given to slaves of specific plantations at Emancipation. On the website of the Dutch National Archives, section on “Suriname en de Nederlandse Antillen: Vrijverklaarde slaven (Emancipatie 1863)” one can also trace family names of emancipated slaves to certain plantation.

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Figure 1. The Sabajo Project in Relation to Communities, Rivers and Creeks Named in This Report



2.0 METHODS

2.1 Research Design

2.1.1 General Approach

The SSM survey was executed according to a mixed method approach that combined mapping of the SSM operations¹⁰, with a brief census of the workers in the mining camps, structured interviews with equipment owners and structured yet more conversational (i.e. qualitative) interviews with selected SSM stakeholders and Newmont staff. In addition, the consultant made observations¹¹ and conducted short informal interviews with mining service providers to obtain general area information.

Fieldwork was conducted from Friday June 30th to Monday July 3rd in the different SSM zones of the Sabajo area¹². In the field, the consultant was accompanied by two Newmont Social Responsibility (SR) staff and one security guard (private security firm, Mozart Security Services Suriname). Newmont's staff presence with the researchers was part of their relationship building approach to SSM.

2.1.2 Research Ethics

Research procedures adhered to professional ethical standards for social science research, including the American Anthropological Association *Ethics Handbook*. Furthermore, the SSM survey was conducted in line with the principles of International Finance Corporation (IFC) Performance Standard # 7 considering Indigenous Peoples (which includes the Maroons), particularly with regard to obtaining Free Prior Informed Consent prior to data collection.

In practice, this approach meant that prior to data collection, the proposed research and methodology were presented to relevant SSM community leaders and the small-scale gold miners in the Sabajo Project. On Sunday June 18th, 2017, Newmont Suriname organized a public methods validation meeting for the Kawina people. During this meeting, the objectives and proposed methods for the SSM survey were presented to Kawina community leaders and other community members, including the gold miners. No objections were voiced with regard to the proposed approach.

On June 24-25, 2017 one week prior to the data collection field work, the consultant visited the majority of SSM operations in the Sabajo area to explain the upcoming study and the methods that would be used, and obtain informed consent from the SSM population. During this method validation visit, the consultant (Social Solutions) was accompanied by four members of the Newmont Suriname Social Responsibility (SR) team and one security guard.

The SR team introduced the researchers to the SSM population, and explained the ESIA research in general terms. Next, the consultant explained the methods that would be used to collect data. For the Brazilian mining teams and service providers, the consultant took care of the introductions and project explanations. The consultant also explained to the target group that their participation was voluntary, and that they were not obliged to answer all or any of the questions.

¹⁰ We define as an SSM Operation: a firm performing SSM activities in one location, and which is owned by one equipment owner or joint venture, with one shared budget. One SSM operation can own multiple pieces of mining equipment and different teams of workers.

¹¹ Observations in mining camps included, for example, sleeping arrangements, type of sanitary facilities and drinking water source, presence of armed guards, amount of planting around the camps. Observations in work areas served to check on the type of equipment, and workers' safety and protection. Observations in cabarets served to verify reports of the number of sex workers.

¹² The term mining zone is used to refer to a concentration of SSM within the larger Sabajo area. Hence Santa Barbara and Margo are different mining zones.

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By the end of the presentation, all visited mining teams were asked for their consent to participate in the survey. One equipment owner initially refused to participate, as he was afraid that the information could be used against him in some way, and voiced that he did not want any surprises from the company. After more communication with this equipment owner and assurances that his information would be treated confidentially, however, he eventually agreed to participate.

During fieldwork, the researchers introduced themselves and explained the purpose and approach to the survey once again, both important issues that miners wanted addressed. Photographs have only been taken with participant consent.

In order to make the researcher's presence in the mining camps non-obtrusive, Newmont representatives and security staff remained at some distance during the interviews. The one-on-one interviews gave the informant a sense of privacy and prevented possible influence of the presence of Newmont staff on interview outcomes – especially where questions concerned gold miners' relations with the company.

2.1.3 Review of Secondary Sources

Maps from the Suriname National Archives were reviewed for evidence of historic settlements and mining activities in or near the Sabajo area. In addition, the consultant reviewed books about Ndyuka history and culture by Thoden van Velzen and Van Wetering (1988), Köbben (1968), and Thoden van Velzen and Hoogbergen (2011, 2013) to obtain a better understanding of the Ndyuka and their (historic) presence in the Sabajo area and participation in SSM activities in this region. Existing written sources contain virtually no information about the Sabajo area and possible human use of this area, or about the Kawina people, and hence most information in this SSM study was obtained from interviews. As much as possible, data obtained from interviews were verified through interviews with other people, and with archival data and literature. Historic maps of the Sabajo area were consulted at the Suriname National Archives (Appendix G).

2.1.4 Research Instruments and Techniques

For socio-economic field data collection, the consultant used three different research instruments:

Area observation sheets were used to characterize the different areas referred to as “Santa Barbara”, “Margo”, “Km 34” and “area of Polaco”. The area observation sheets asked questions about the number of mining operations in the specific mining area, the presence and numbers of stores and cabarets, presence and number of sex workers, mobile vendors, and other service providers; distance to the nearest police and health posts, child labor and the share of women in the SSM population. The area observation sheet is attached as Appendix F-A.

A simple survey form was used to list all inhabitants associated with each one of the SSM operations, including non-working members such as wives of workers and children. For each person associated with the operation, the interviewer recorded: the name, age, function in the mining team, ethnic affiliation, birth village, current location of residency, formal education and additional skills training, type of health insurance, and whether or not the person had suffered from a work-related accident, illness or injury. In most camps, not all camp inhabitants were present during the interview because they were at work at some distance from the camp, or they were not in the area at the time. In those cases colleagues provided most of the information, but not all questions could be answered for all the persons associated with each operation (Appendix F-B).

Another questionnaire was used for interviews with the equipment owners. These questions focused primarily on the types of equipment used and economic management of the operations. Among others, the researchers asked about: the value of equipment, remaining debts related to the purchase of equipment, debts incurred to cover

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operational expenses (e.g. fuel), the amount of fuel used and gold found per time unit (past two mining cycles); and possible payment to a land boss. Additional different questions were asked to validate the answers. Written documentation of expenses and earnings was not requested from the gold miners.

In addition to these more structured interview forms, the consultant conducted qualitative interviews with persons with a specific role in, or knowledge about, the SSM sector in the Sabajo area. Objective and associated guiding questions were developed in advance, but the sequence of questioning was less strict than with the survey. Specific topics that were explored in this manner included the history of SSM in the Sabajo area, the situation of land claims and land bosses, and the role of urban financiers. Target persons for these interviews included traditional authorities, land boss(es), and Kawina individuals with a long history of SSM in the Sabajo area.

2.1.5 Sample Size and Strategy

The study target was to interview representatives of all SSM operations and SSM service locations in the Sabajo area (i.e. 100% sample). Information from Newmont's security department was used to locate SSM operations in the area. It is likely that Newmont's security map correctly identifies all general areas in Sabajo where SSM takes place. Verification with gold miners also suggests that no additional operations were present in the Sabajo Project area at the time of the fieldwork. Nevertheless, because SSM are mobile and may move into the area from different directions, there is a chance that one or two isolated operations have not been identified.

Over the course of the fieldwork, the researchers identified a total of 18 separate SSM operations. Seven of these operations belonged to Brazilian equipment owners, six were run by Kawina equipment owners, and the remaining operations belonged to other Suriname nationals (Table 1).

Table 1. Number of Equipment Owners, Workers, Service Providers and land bosses active in the Sabajo Area During Fieldwork period (June 30-July 3, 2017), by Nationality

	Kawina	Other Suriname	Brazilian	Other	Total
Number of equipment owners	8	5 ¹³	6	0	19
Nr of other camp inhabitants ¹⁴ present in surveyed operations (excl. owners)	12	85	56	4 Dominican	157
Number of interviewed and/or observed SSM service providers	0	2	8	11 ¹⁵	21
Number of interviewed land bosses	2 (incl. 1 who was also equip. owner)	0	0	0	2
Est. total SSM population	21	92	70	15	198¹⁶

Three Suriname equipment owners and one Brazilian equipment owner could not be interviewed at Sabajo because they were in Paramaribo at the time of the fieldwork. For the Brazilian operation, information was obtained from the wife of the equipment owner. Three Suriname equipment owners (two Kawina, one Matawai Maroon)

¹³ Hindustani (1) Matawai (1) Saramacan (1) Ndyuka (2)

¹⁴ Camp inhabitants includes all persons living in the camp, including the cook and people who do not work

¹⁵ 1 Guyanese, 1 Chinese, 9 Dominican

¹⁶ The numbers in the column do not count up because one person, who was both a land boss and an equipment owner, is listed twice in the column but only counted once in the total.

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were interviewed in Paramaribo. It must be understood that this study provides a snapshot in time; the SSM population is not stable, and people move into and out of the area as new opportunities arise here or elsewhere.

With regard to service providers, an employee of a shop¹⁷ along the road to basecamp and the owners of four cabarets in the area were interviewed. This group represented all such services in the target area.

2.1.6 Mapping Methods

The GPS coordinates of all identified SSM operations were recorded.

The maps were created by an ILACO mapping expert, based on shape files that were received from Newmont, and input from the Social Solutions researchers.

2.1.7 Limitations

Anthropological field work relies on building rapport with, and gaining trust from the local communities with whom the research is conducted. Establishing such close working relations with local people poses limitations due to the very short field work period. As a result, some information that may be gained through a longer field investigation survey could be lacking. However, by taking the time for social engagement with gold miners and mining service providers, and by asking the same questions to different persons to verify answers, the researchers are confident that the data in this report are reliable and reasonably complete.

Interview responses are subject to self-reporting. Responses may be influenced by response bias if respondents are familiar with desired behavior and respond in the 'correct' way, or if they do not want to give certain information but still want to provide an answer. Long-term experience conducting research with SSM groups, and the use of control questions and observations helped the consultant minimize this bias.

¹⁷ The shop owner spoke Chinese and hence the interview was performed by his shop assistant.

3.0 MAPPING RESULTS

The maps of SSM presence in the Sabajo Project are presented below (Figures 2-5). (The maps are also submitted separately in Adobe format).

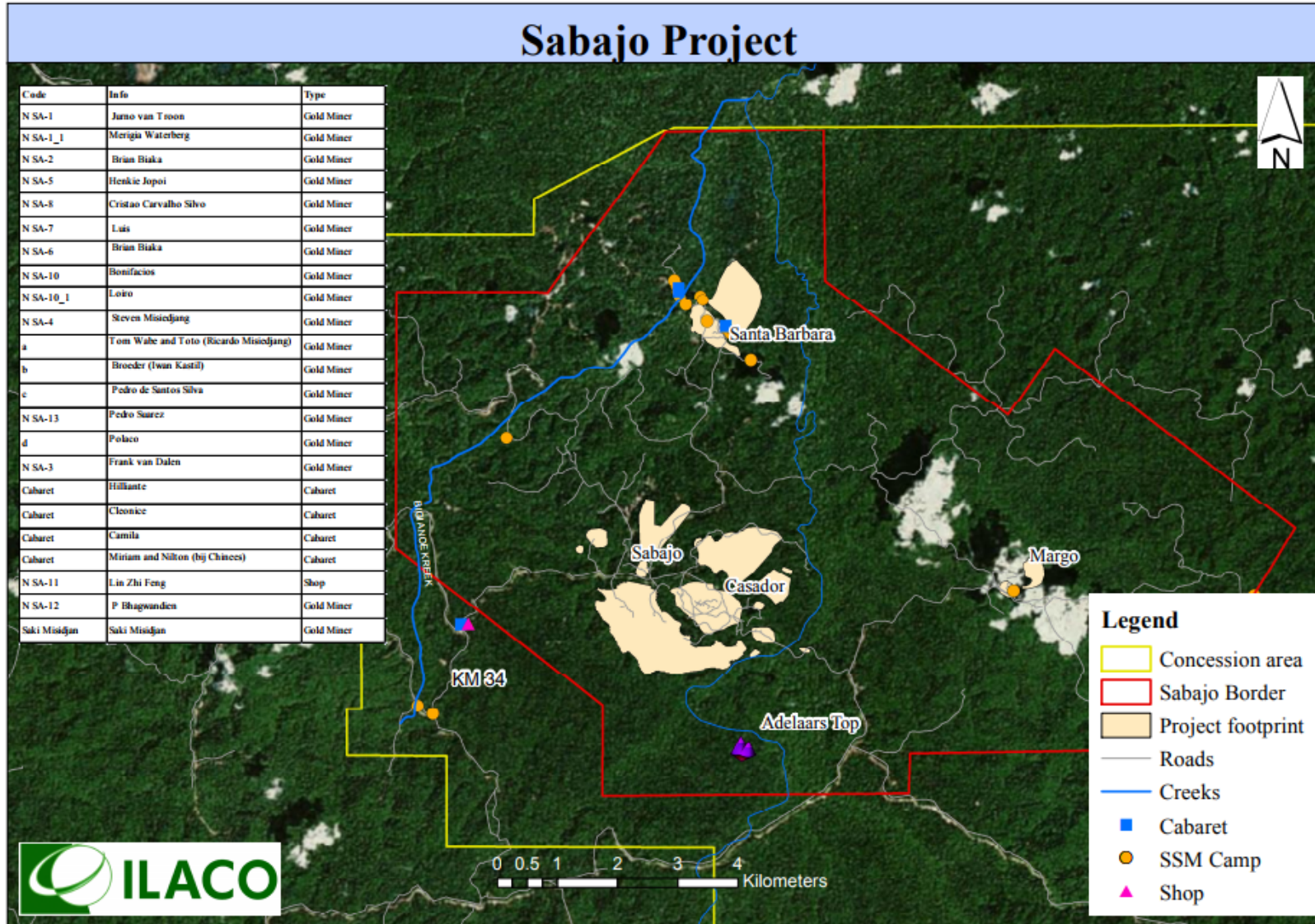
The Map labeled “Sabajo Project” shows the projected location of the Sabajo mining infrastructure (pits, tailing ponds) and three SSM zones within the Sabajo Project: Santa Barbara, Margo and Km. 34. A total of 17 SSM operations are shown on the map, with the largest concentration in Santa Barbara. It also is evident that most cabarets are located in Santa Barbara. The 18th mining operation on the list on the “Sabajo Project” map was a one-man operation that moved around, and his location is not recorded.

In all maps, the mining operations are numbered following the Newmont Security numbering system. Operations that had not been numbered by Newmont security have been indicated with letters a-d. In the two cases where two operations had the same security number (since they worked in one location), the operations have been labelled separately with “_1”.

The Santa Barbara map shows that Brazilian gold miners are not evenly distributed over the area, but concentrated in the Northern section. In the Margo area, which features only three SSM operations, no Brazilian gold miners are active.

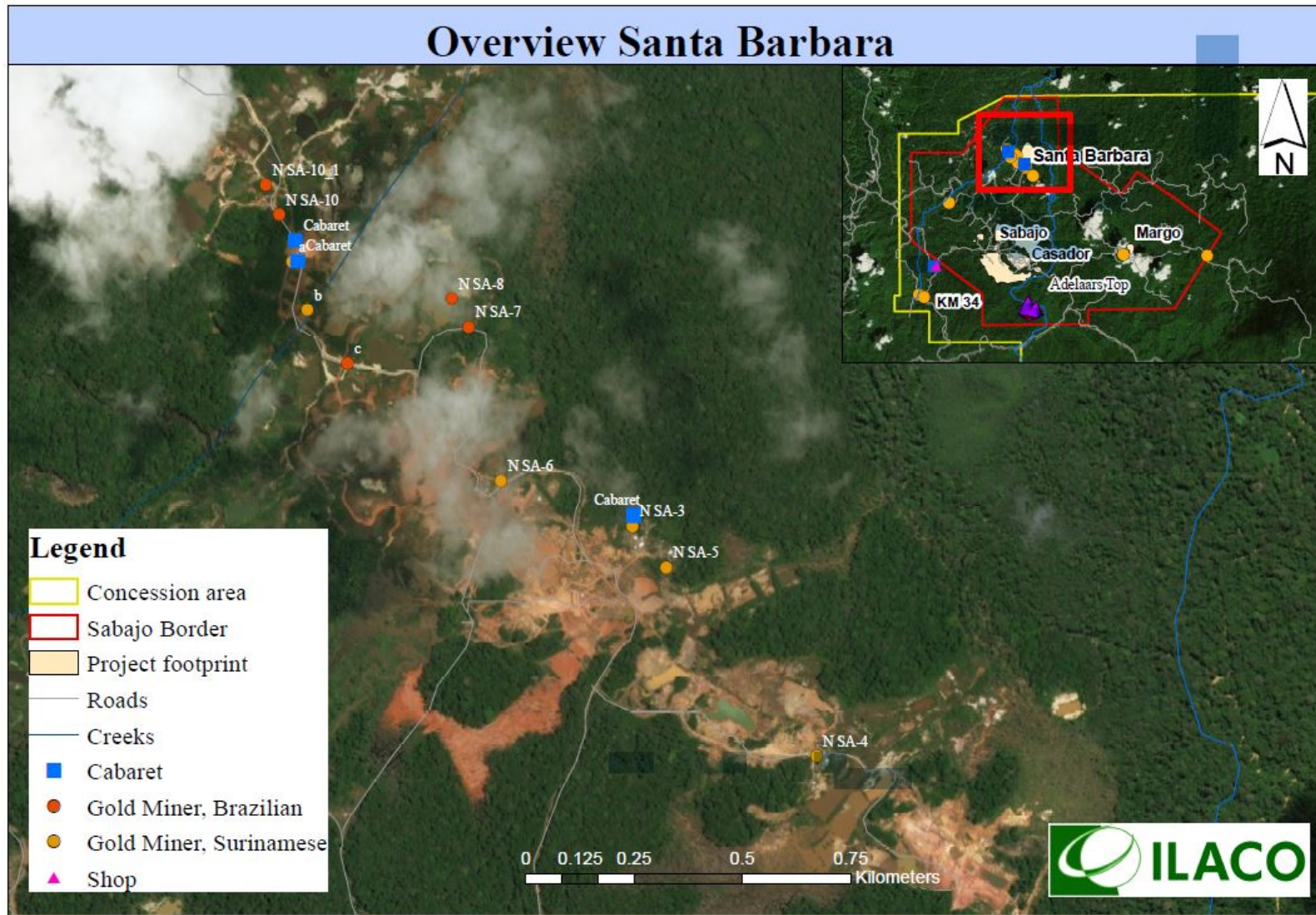
SMALL SCALE MINING SURVEY – SABAJO ESIA

Figure 2. Sabajo Project



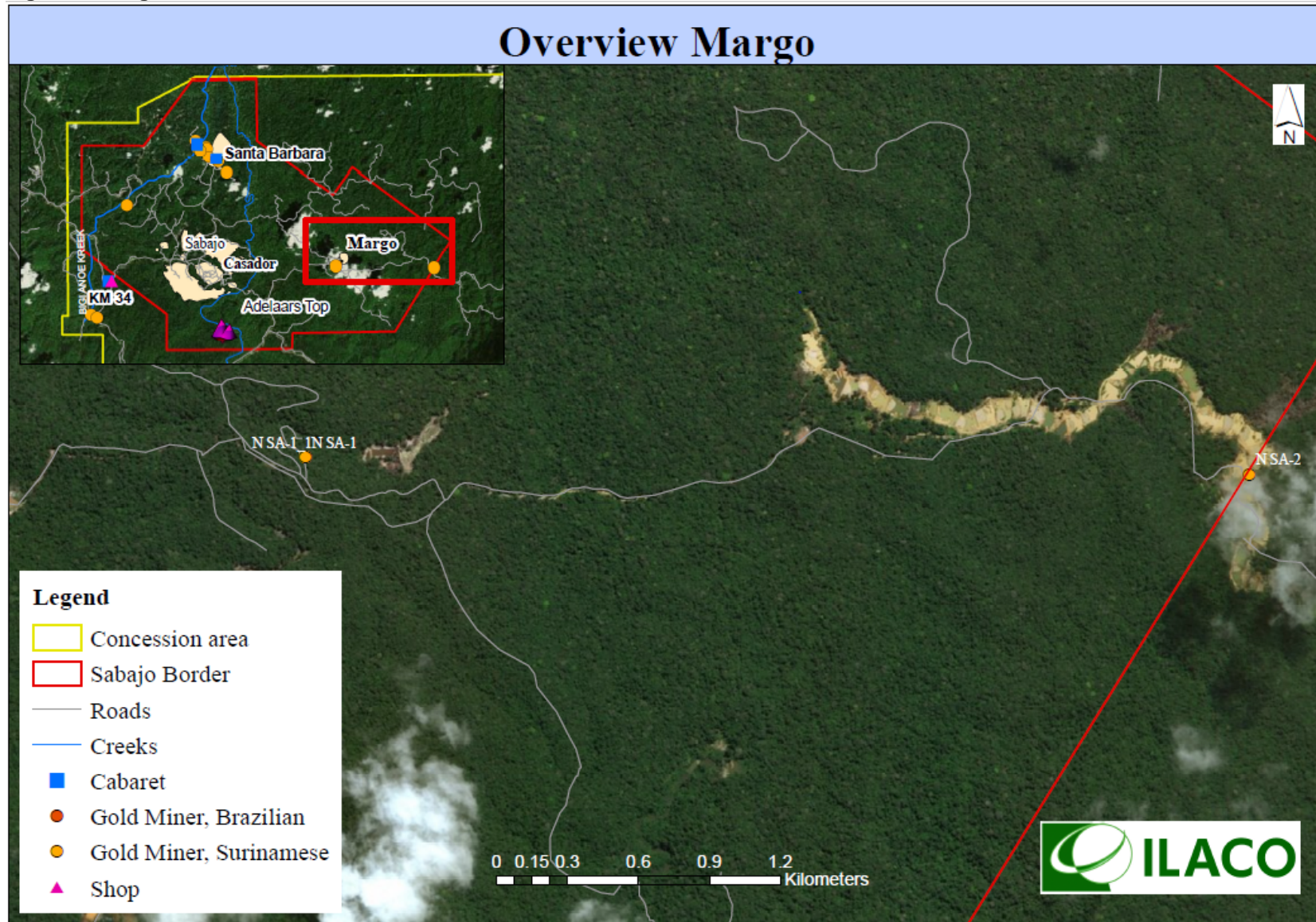
SMALL SCALE MINING SURVEY – SABAJO ESIA

Figure 3. Santa Barbara



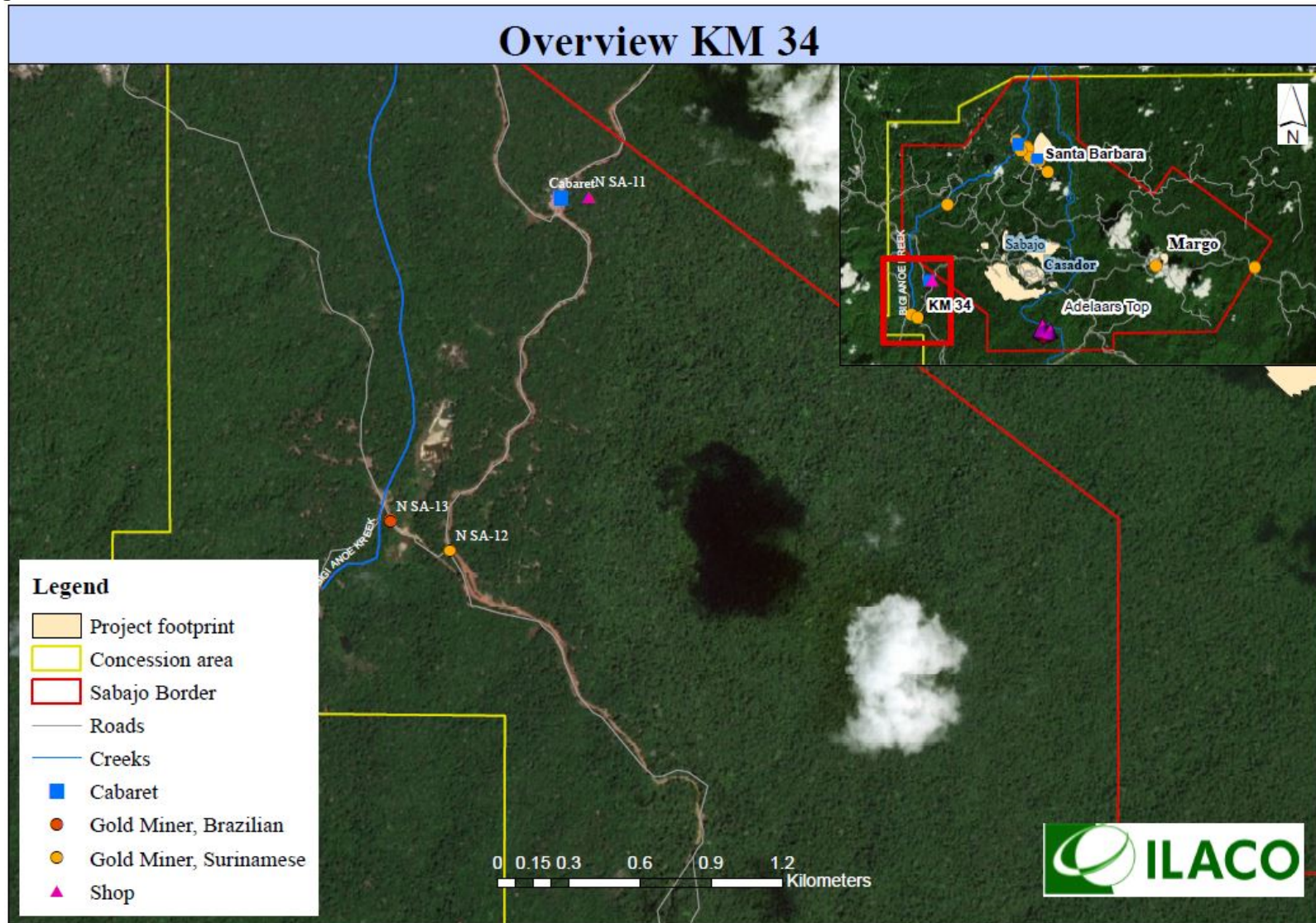
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Figure 4. Margo



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Figure 5. Km. 34



4.0 RESULTS OF SOCIAL SCIENCE DATA COLLECTION

4.1 Small Scale Miners

4.1.1 History of Small Scale Mining at Sabajo

The Sabajo area has a long history of SSM activity¹⁸. During the first gold rush (1880-1910), mine workers primarily came from different Caribbean countries¹⁹. At that time, a St. Lucia man named Mana-sang operated a mine near Sabajo hill²⁰. The gold miners were mostly from Martinique and St. Lucia. They came to Suriname to work for several months or years in the mines before returning home with their earnings. Along the Tempati and Small Commewijne creeks, one still finds the graves of gold miners who lost their lives in those days. Historic maps confirm the presence of gold mining concessions in the area between the Small Commewijne and Tempati Creeks (Annex 5). The most common gold concentration device used then was the longtom, a long, narrow sluice box that was fed manually, and lined with old jute (rice) bags to trap the gold (Figure 6).

Figure 6. Gold miners with a “Long Tom” op het terrein van de goudmijn “Placer L. & F. de Jong”



¹⁸ Different interviewees made reference to SSM along the Tempati Creek and Little Commewijne River watershed by people from St. Lucia and Martinique, in the late 19th century, (e.g. Mr. Francis, pers. com. 14-07-2917, Brothers Henk and Leo Noordzee, pers. com. 16 July 2017).

¹⁹ In 1901, 5,551 registered gold miners worked in the gold fields of the Suriname interior, mostly from Caribbean countries (Heilbron and Willemsen 1980).

²⁰ The exact location of this mine is vague. Mr. Francis reported that it is at Adelaarstop (Mr. Francis, Land Boss, pers. com. 14-07-2917, confirmed by brothers Henk and Leo Noordzee, pers. com. 16 July 2017). Mr. Jopoi, however, said that Manasang must have been somewhere between the Kleine Commewijne River and Tempati creek; not at Adelaarstop (H. Jopoi, Mine Operator, pers. com 03/11/17). Mr. Jopoi conveyed that if they would know where it is exactly, they would go there, because a lot of gold was found and it is likely that there is more.

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During Suriname's first gold rush, Maroons were not heavily involved in the actual mining process, but they played an essential role by transporting people and materials across rivers and creeks to the gold fields (Thoden van Velzen and Van Wetering, 2013). Respondents were not unanimous about whether or not Kawina people were also involved in freight services (*fuyas*) for the gold industry at the time. According to some consulted Kawina interviewees, their ancestors (*afó*) were among these transport providers for gold miners in the Commewijne watershed area²¹. Others stated that at the time, Kawina men only worked in timber production and balata bleeding in this area²².

Suriname's gold industry collapsed after 1908 due to the lack of management expertise, ineffective exploitation, widespread illegality, tensions between workers and concession holders, and the freezing of the gold price on the world market (Heemskerk, 2000).

In the decades after the first gold rush, Maroons in different parts of Suriname occasionally traveled to the gold fields to work for a couple of weeks (Heemskerk, 2000). They worked manually, with shovel, a pick-ax, a 14ate, and a longtom. These activities helped them earn some fast emergency cash, but at this time SSM was not a primary livelihood activity. One Kawina gold miner and two other Kawina respondents reported that their ancestors had occasionally worked gold this way, though not necessarily in the Sabajo area²³. In the 1970s and '80s, very few people worked gold anymore in Suriname²⁴. Instead, the fathers and grandfathers of the present-day Kawina gold miners used the watershed area of the Little Commewijne River and Tempati Creek for logging, fishing and hunting²⁵.

During the interior war (1986-1992), a civil conflict between the national army and a group of Maroon insurgents made the interior of Suriname barely accessible. The main leader of the Maroon insurgents, Brunswijk, was a Ndyuka Maroon. Even though many Maroons – including many Ndyuka – did not or only halfheartedly support his cause, the military government aimed its reprisals at the Maroons generally. Violence of the national army specifically targeted Ndyuka Maroon communities located near the Moengo area, where the Maroon guerilla groups were believed to hide out. The Kawina Ndyuka communities of Pennenica, Java, Moismoiskondre (=Moengotapoe), and Gododrai (=Mapane) were burned by the military forces, and their populations fled to Paramaribo, the Moengo area, French Guiana, and further upriver. The families that withdrew further into the forest lived for years in the area between the Small Commewijne River and Tempati Creeks, hiding from the military forces and living from what the forest had to offer²⁶.

During the interior war, schools in the interior closed and many Kawina children could no longer attend school. Moreover, because the war broke out during the holiday season, youngsters who attended middle school in Paramaribo and had come for holidays to the interior could not return to the city. One of the gold miners reported: "We had hardly anything to eat. The situation basically forced us to fight with the Jungle Commando²⁷. All men you see here fought in the war"²⁸. By the time the interior war had ended (1992), a

²¹ H. Noordzee, pers. com. 16 July 2017 (ex-gold miner); F. Francis tells that his grandfather (term is used loosely for ancestors; may also be grand-uncle or other relative) worked for the Mana-Sang mine owner. The grandfather showed him where one can find gold (pers. com. 14-07-17, by phone).

²² H. and L. Noordzee, 16 July 2017. Balata peaked in the period 1910-1920. By 1950, balata production had virtually vanished. Livelihood activities in the area verified during validation session, among others; Mr. H. Jopoi, Mr. C. Patca, Mr. F. van Daal, 03/11/17

²³ R. Misiedjang, pers. com. 19 July 2017; H. and L. Noordzee, pers. com. 16 July 2017. One gold equipment owner reported that between 1978 and about 1982/83, he went with his father to the mining areas, working with a longtom, but that was in Sella Creek (Ndyuka mining area, Tapanahoni)..D. Misiedjan, pers. com. Validation session, 03/11/17

²⁴ Gold production declined to less than 2 kg/yr by 1976.

²⁵ This was mentioned by Kawina in different interviews, incl: H. and L. Noordzee (16 July 2017), Kapt. Noordzee and Kapt. Nijda (17 July 2017), F. Francis (19 July 2017), H. Jopoi (3 Aug. 2017). The brothers Noordzee reported, as evidence of historic logging activity in the area (before use of the chain saw): "Sometimes you see trees that are cut with an ax half way, and because the tree is hollow, it has not been cut further. The cutting height would usually be about a man's breast height, but now the tree has grown you see the cutting marks are much higher". Specific locations have not been mentioned.

²⁶ At least two families of present day gold miners in the Sabajo area were among those living in the forest.

²⁷ The Maroon insurgents headed by Ronny Brunswijk, who fought a guerilla war against the military government of Desi D. Bouterse.

²⁸ Mr. H. Jopoi, pers. com. 25 June 2017.

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large number of young Kawina Ndyuka men had dropped out of school, faced discrimination in Paramaribo, and knew the forest as their back yard. In that same period (early 1990s), the second Suriname gold rush took off. Once the forest was safe again, Brazilian gold miners, who faced stricter control on SSM in their own country, started coming to Suriname and rapidly modernized the SSM industry.

In the meantime, around 1986, a Paamaka man referred to as “Gayons” performed gold exploration activities in the Sabajo area as part of his work as a staff member for the Geology and Mining Department (GMD). As soon as the Interior War ended (1992), he started gold mining in the Sabajo area. The Kawina man J provided transportation for him, driving a DAF truck. While driving J noticed that they passed their old Kawina villages, and he discovered that this man was mining in the Kawina area. At the time, J had an SSM operation at Sella Creek. He sold this equipment and started a new operation in the Sabajo general area, in 1993. He made this move because this was an opportunity to work in “their own place”²⁹.

J, along with some Kawina family members from Pennenica/Moismoiskondre and a handful of others came with six sets of pumps³⁰ to the Sabajo area, which they referred to as *Pikin Kawina* (Little Commewijne River). They started working with small hydraulic pumps (4-inch) and a long-tom. At the time, there were no roads so far into the interior. One could drive with a car up to where the old (then abandoned) villages were. From that point onward one had to walk for another 7 hours through the forest to reach the working location. All equipment, fuel and supplies had to be carried with them. These Kawina gold miners established a large camp where everyone came together, named “Combé”. This camp was situated at the location of the present Newmont base camp³¹. Among others, they worked the creek that Newmont now uses to extract water.

Operational expenses were high due to difficult access to the location. A logging road had been constructed but the logging company, MUSA, did not want them to use it. It was too heavy to carry in all supplies all the time. Therefore, in 1995, the Kawina equipment owners moved their equipment to another location where they had easier access. After they had left, around 1996 and in subsequent years, Gayons brought several teams of *garimpeiros*, or Brazilian gold miners, to the area³². These Brazilian equipment owners included a *garimpeiro* (nick) named Caçador³³. Among others, they started working at the location of the present “Casador pit” (Figure 2). Gayons collected land boss fees from the Brazilian mining groups.

²⁹ Mr. H. Jopoi, validation session, 03/11/17

³⁰ Reported by H. Jopoi and his uncle H.A. Jopoi, who were among these first Kawina gold miners in the area after the interior war. Confirmed during validation meeting. Other equipment owners at this time included F. van Daal and C. Patha.

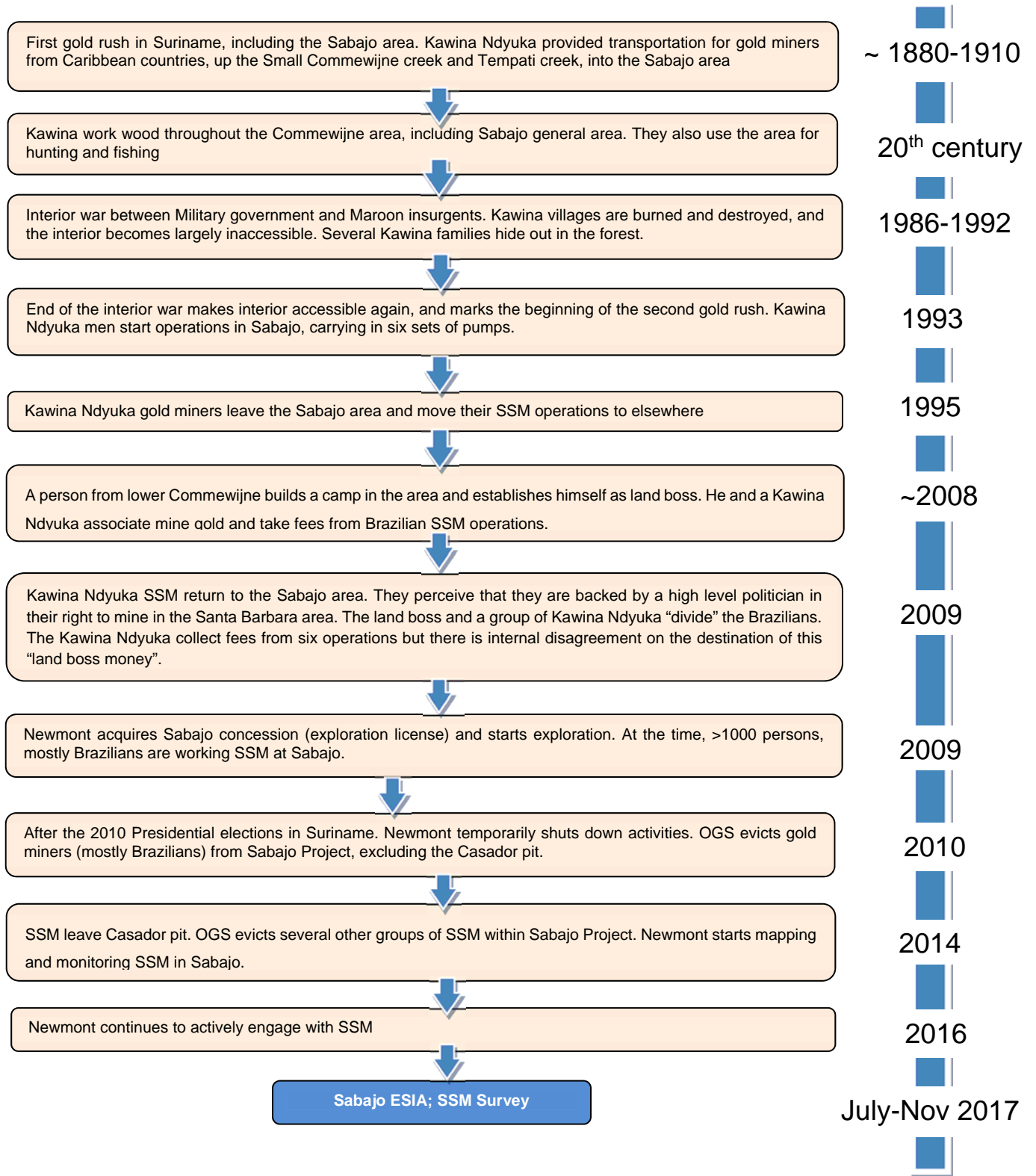
³¹ Ibidum.

³² H. Jopoi, Validation meeting 03/11/17

³³ F. Francis, pers. com. 13/11/17, confirmed by R. Misiedjan, pers. com. 12/11/17. It is not certain if the Brazilian man named Caçador arrived exactly in 1996, but he was brought in by Gayons before 2000.

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Figure 7. Chronology of Gold Mining Activity and Key Events at Sabajo with Approximate Dates



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The current land boss at Santa Barbara first arrived in the area currently referred to as “Santa Barbara” around 2000 to prospect for gold³⁴. According to him, there were no Surinamese people working at Sabajo at the time, only Brazilians. It was bigger then, about 40 operations³⁵. He left after some months, and returned around 2002-3, this time together with a Kawina man. It is unclear whether they were actively mining and/or collecting land boss money in the Sabajo area at the time³⁶. After some months they left the area again. In 2008, the current land boss obtained a mining concession along the Kleine Commewijne River, down river of Santa Barbara³⁷. He started mining and collecting land boss money in Sabajo, taking over a couple of Brazilian mining teams. He also opened up a dirt road to Santa Barbara. In 2009 and 2010, Brazilian mining teams came to Santa Barbara, and started working under his tutelage.

In 2009, about six months after he obtained his concession, the Kawina who had mined for gold in the area in the early 1990s returned to the Sabajo area³⁸. These Kawina equipment owners were mostly from the community of Penneica³⁹. When the Kawina group returned to the area, the current land boss and one other were collecting concession fees from the Brazilian equipment owners; respectively eight and nine operations. According to one Kawina equipment owner, the Kawina gold miners demanded that they gave the Kawina people a couple of the Brazilian operations to collect concession fees, because this was their ancestral area⁴⁰. They obtained four operations from the current land boss and four from the other⁴¹. After a while, this secondary land boss was told that he could no longer collect the percentages, and he left the area. This account differs somewhat from that of the current land boss, who recalled that he gave the Kawina authorities a couple of operations on his own initiative. It is quite certain that around 2009, he had left the area and both the current land boss and a group of Kawina gold miners –in name of the Kawina people- were collecting land boss fees from different Brazilian SSM operations in Sabajo.

Several respondents reported that a high level politician, who was in the area at the time, told the Kawina equipment owners that this place was theirs and they could mine there. Those who did not have their own mining equipment were encouraged to bring others there to take a percentage share⁴². In order to obtain a legal gold mining concession, the Kawina equipment owners created a Foundation: *Stichting Kawina Pikin*. According to the leading gold miner of the group, they were sent from pillar to post, and ultimately told by the OGS that there were no concessions available anymore⁴³.

In April 2009, Newmont Suriname (then named Surgold) obtained exploration rights to the Sabajo Project area. The Sabajo Project Manager estimates the number of small-scale gold miners at the time at more than 1000 individuals; most of them Brazilians⁴⁴. The only area where Surinamese were actively working was the Santa Barbara area.

³⁴ F. Francis, pers. com. 3 August 2017.

³⁵ F. Francis, pers. com. 3 August 2017. This estimate concurs with the observation of Newmont's Sabajo Project Manager Mr. Ribeiro, who estimated that in 2009, there were more than 1000 persons working in the Sabajo area. He also reports that there were very few Surinamese gold miners then; mostly Brazilians (J. Ribeiro, pers. com. 10 August 2017).

³⁶ Different respondents provided contrasting information on whether or not they were collecting land boss fees at the time.

³⁷ This document has not been observed and the concession claim could not be verified.

³⁸ H. Jopoi, pers. com. 3 August 2017. This was reportedly by the end of 2008/early 2009.

³⁹ These gold miners included: Henkie Jopoi, Henk Albert jopi, Cyrano Patha, and Marcel J. Misiedjang, who are currently the shared owners of one SSM operation at Santa Barbara.

⁴⁰ According to F, it were the Kapiteins from Kawina who came to him to ask for a contribution. The Kawina equipment owners were collecting the concession fees in name of the Traditional Authorities (pers. com. 19/07-17)

⁴¹ H. Jopoi, confirmed by D. Misiedjan. Validation meeting 3 Nov 2017.

⁴² Pers. com: H. Jopoi and H.A. Jopoi (25 June 2017), H. Noordzee 16 July 2017), F. Francis and R. Misiedjang (19 July 2017). NB: F. Francis is a cousin of H. Noordzee.

⁴³ H. Jopoi, pers. com. 25 July 2017

⁴⁴ J. Ribeiro, Project Manager Sabajo, pers. com. 10 August 2017

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By the end of 2010, it became unsafe for Newmont to continue its exploration activities in that area, and the company asked the Government of Suriname (GoS) for assistance in evicting the gold miners⁴⁵. The OGS got involved and gave SSM equipment owners in the area a notice that they had to leave by a certain date. Most Brazilian operations had left the area by early 2011, but one group of gold miners continued mining the Casador pit⁴⁶. In 2014, this group of gold miners left as well. Since then, SSM operations have occasionally been asked to leave when they started mining again in places where they are not allowed to go, and/or when they are affecting Newmont's operations (e.g. water quality, roads)⁴⁷. These cases are typically individual cases of no more than 15 individuals, who are detected and asked to leave within a short time of their establishment⁴⁸. Newmont Security Managers explained that SSM are currently not removed from the Santa Barbara and for the drilling program work, Newmont works alongside the SSM⁴⁹. This strategy signifies a "paradigm shift within Newmont on how to engage with SSM"⁵⁰.

4.1.2 Small Scale Miner Population

4.1.2.1 Demographics

The total number of persons performing economic activities and/or living within the Sabajo concession area was estimated at approximately 200 individuals. This number includes individuals who take percentage shares from gold miners but may not permanently be present in the area. The largest share (~70%) of these individuals make a living in the Santa Barbara mining area (Table 1). The largest share of Kawina also were encountered in the Santa Barbara mining area (see figures in brackets). The length of continuous presence in the area was not recorded.

The ages of camp inhabitants ranged from three years old – the child of a Brazilian gold miner- to seventy – the assistant of an excavator operator. When removing the child from the sample, the youngest camp inhabitant was 18 years of age. The average age of camp inhabitants was 37.1 years (excl. the 3-year old; N=146⁵¹; Median = 36)⁵². There was no significant difference between the mean ages of Suriname versus foreign camp inhabitants. The team observed no indicators of child labor in the Sabajo SSM operations. Also among service providers, no cases of child labor were reported. Generally, girls below the age of 16⁵³ seldom work in cabarets in Suriname ASM areas – though incidental exceptions have been reported (Heemskerk, 2017). All consulted CSW were over the age of 18.

In order to obtain a better understanding of the ethnic origins of the SSM population, we asked the inhabitants of mining areas about their ethnic affiliation, as well as where they were born and where they go when they are not in the mining area. Figure 8 presents the national or ethnic (for Suriname nationals) affiliation of individuals present in the Sabajo SSM areas. The different Maroon groups together (Saramaka,

⁴⁵ Mr. Mohan (Security Investigator) and Mr. Vianen (Security Supervisor), pers. com. 19 July 2017.

⁴⁶ This mine was named after a Brazilian man, named Caçador (possibly his last name). He had been mining in different locations in Suriname for many years, before he went to Sabajo and discovered the deposit at the location now named "casador pit".

⁴⁷ For example, one team had to move an operation because they damage the gate and an existing road (2016, Bhagwandien); Another team was stopped because they undermined a road (2017, Van Troon); another team had to move because their tailings polluted a creek that Newmont uses (2017, Pedro); a camp just behind the NM base camp was destroyed (2016).

⁴⁸ J. Ribeiro, Project Manager Sabajo, pers. com. 10 August 2017

⁴⁹ Dries Hugo, Security Manager Suriname, and Otto Sloane, Security Manager South America, 23 July 2017.

⁵⁰ Ibid.

⁵¹ Only inhabitants of mining camps, no service providers. Excluding 30 missing cases of persons who were not available during the interview, and whose age could not be provided by colleagues.

⁵² The sample for calculation of the average age is smaller than the total estimated population in the SSM areas because the age could only be recorded for people who were actually present at the interview. Some people were at work away from the camp area where the interviews were conducted, and the equipment owner or fellow workers did not know the person's age. In those cases people were registered by name and function, but their age was not recorded.

⁵³ By Suriname law, the age to be considered a sexual offense (*zedendelict*) is under 16 years.

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Ndyuka, Kawina⁵⁴, and other Maroons) form the largest group of workers in the area. The second largest group are the Brazilians (although they should not be considered one ethnic group). The service sector is dominated by Dominicans and Brazilians. In addition, there is one Chinese store owner.

Table 2. Total Number of Individuals (And Kawina Individuals) Who Perform Economic Activities And/Or Live in The Sabajo Concession Area

Area	Equipment owners	Workers and other camp inhabitants	Land Boss	Service providers	Total Number (among whom ... Kawina)
Santa Barbara	15 (8)	112 (9)	2 (2 ⁵⁵)	12 (0)	140 (18) ⁵⁶
Margo	3 (1)	33 (3)	0	0	35 (3 ⁵⁷)
Km 34	1 (0)	6 (0)	0	0	7 (0) ⁵⁸
Operation of Polaco ⁵⁹	1 (0)	6 (0)	0	0	7 (0)
Road to basecamp	0	0	0	9 (0)	9 (0)
TOTAL	18 (8)	157 (12)	2 (2)	21	198 (21⁶⁰)⁶¹

⁵⁴ One person reporting mixed Kawina-Ndyuka descent was grouped among the "other Ndyuka".

⁵⁵ This includes one person from the lower Commewijne river area, who also self-identified as "Kawina".

⁵⁶ One of the land bosses also is an equipment owner. In the total, this person is only counted once; therefore the numbers in the row do not add up

⁵⁷ One Kawina individual owned an operation at Santa Barbara, and one operation at Margo. In the totals, this persons is only counter once in the total.

⁵⁸ Excluding one camp by Brazilian equipment owner Pedro Suarez

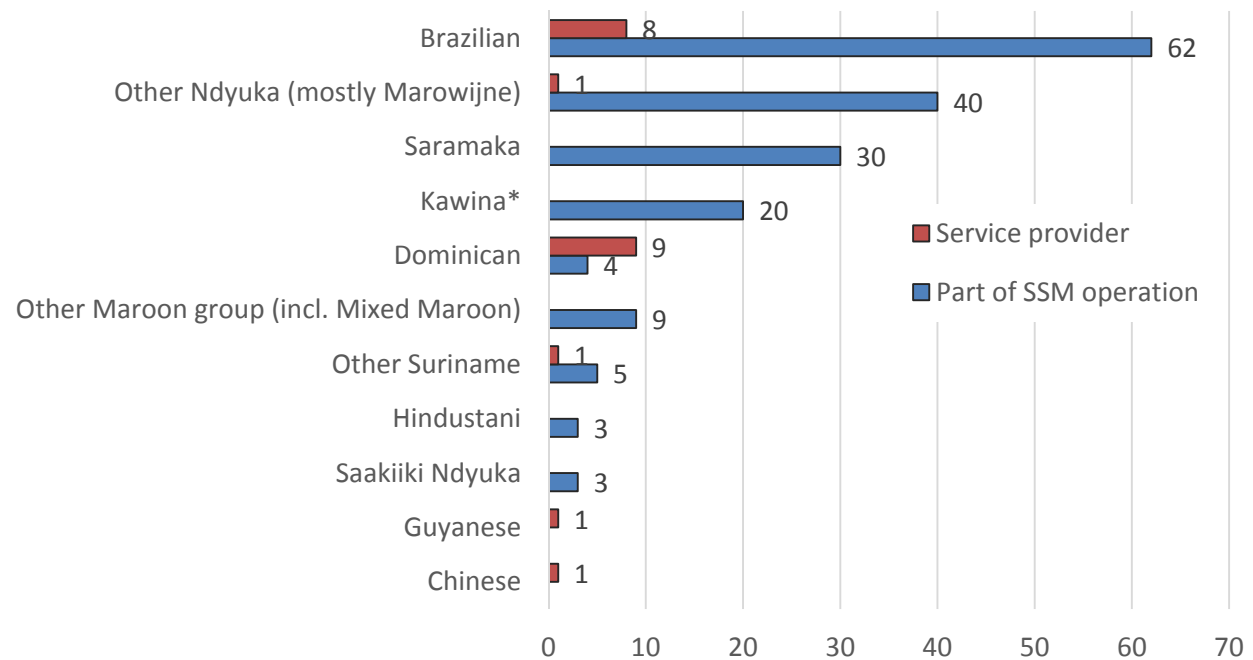
⁵⁹ This equipment owner and his workers had left the area at the time of the validation meeting.

⁶⁰ The population figures suggest that about 10 percent of the SSM population in the Sabajo area are Kawina people. It must be taken into account though, that almost half of the equipment owners are Kawina, and the non-Kawina equipment owners are mostly Brazilians who pay to a Kawina (if we count F as a Kawina). The Kawina equipment owners have consciously made a choice for working in this location, because in their perception this is Kawina land, so other SSM cannot chase them away and they do not need to pay to a land boss. A similar pattern is observed in the Merian area. A large share of the Suriname equipment owners were Paamaka, as well as the land bosses. Workers were mostly from somewhere else.

⁶¹ In the total, every person is counted once. So the person who is listed in the table both as an equipment owner and as a land boss, is counted once. Also the person who is listed as an equipment owner in Santa Barbara, and once again in Margo, is counted once in the total. Therefore the numbers in the rows and column do not add up.

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Figure 8. Ethnic or National Background of Individuals in the Sabajo SSM areas (N=197⁶²).



Of the 20 individuals in the SSM business in Sabajo who identified themselves as “Kawina”, more than half (11) were born in Paramaribo – though one of them was raised in Marowijne district. Only three individuals were born in one of the Kawina communities along the Commewijne River (Pennenika and Mapane). One person was born and raised in Marowijne district, one in Commewijne district, and for three Kawina individuals the place of birth was not obtained.

Of the other Surinamers from whom a birth place was recorded, just under half (45.5%; N_{total}=110) were born in Paramaribo, 16.4 percent in Sipaliwini, 10.9 percent in Marowijne, 6.4 percent in Brokopondo district, and the remaining four individuals in one of the other coastal districts. All Brazilians and Dominicans were born in, respectively, Brazil or the Dominican Republic.

Almost all persons working in SSM operations in Sabajo go to Paramaribo when they leave the mining area (93.4%; N=166⁶³). Two persons reported that they always stayed in the gold bush, and others went to see their families in other districts.

Educational achievement in the SSM population is low. Almost nine out of every ten individuals had no more than elementary education (87.4%), and more than a third of the SSM population had not even completed elementary school (38.7%, N_{total}=113⁶⁴). Individuals who had studied further had completed middle school (6.3%), lower technical education (5.4%) or lower vocational training (LBO, 1 person). Respondents reported virtually no other diplomas or certificates achieved. Among those who did (N=9), we recorded: one truck driving license; certificates for excavator operator (3); a training certificate for gas, water

⁶² Excluding landboss F, who cannot be counted as a service provider or part of an SSM operation

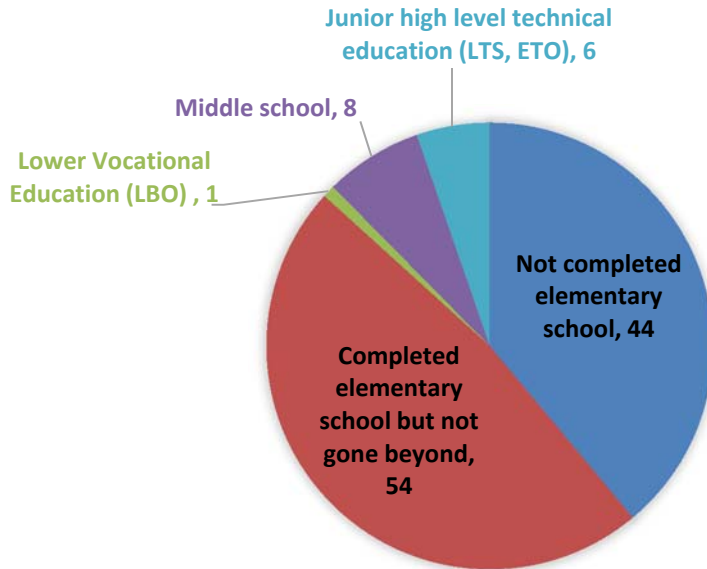
⁶³ Service providers excluded. Also excluding 10 missing cases.

⁶⁴ Educational achievement was not recorded for people who were not present during the interview, because colleagues typically did not know this information.

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and electricity(1); a technical certificate from the State oil company(1); electrician training (1); construction diploma (2); welder/mechanic (1). One individual held two diplomas/certificates.

Figure 9. Educational achievement among SSM in the Sabajo area (N=113⁶⁵)



4.1.2.2 Gender Analysis

The majority of the SSM population in the Sabajo area is male. The researchers registered only 18 women (10.1%; N=169) in all Sabajo SSM operations. Women mostly worked as cooks but one woman was an equipment owner. On the other hand, women dominate in the mining service sector mainly as Commercial Sex Workers (CSW) (17 women; 81%; N=21) (Figure 9). The researchers did not encounter any Kawina women in the SSM population of the Sabajo area. The women identified in the current survey were Brazilian (N=21), Dominican (N=10), and Suriname Maroon women (3).

The largest share of men were workers in the SSM operations, also called *porcentistas* (Br.) since they work for a percentage share of the gold production (66.9%; N=157; Figure 10). The actual share of workers in the SSM population is even somewhat higher, because the figure excludes an unknown number of workers associated with two operations. The second and third most performed job among men were those of, respectively, equipment owner (10.8%; N=157) and excavator operator (7.0%; N=157). Both individuals collecting “concession fees” from Brazilian gold miners were also males. One of these persons was also an equipment owner (in Fig. 10 he is indicated as equipment owner). Professions under the label “other” included mechanic, site helper, transport provider, cabaret owner, construction and assistant to the excavator operator.

In-depth research on the position and situation of commercial sex workers (CSW) in the Sabajo area was not performed as part of the current survey. However, in informal conversations during the field work and the validation sessions, different Dominican women reported having been misled in coming to Suriname.

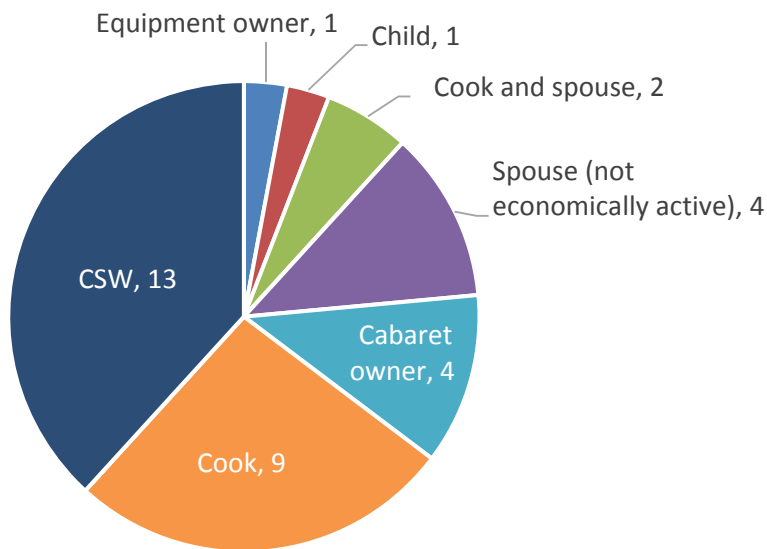
⁶⁵ Information about education could not be recorded for all individuals, because many people were not present during the interviews (e.g. they were at the work site) and the colleagues who were responding did not know this information.

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They had been told that they could work in a bar, nail salon or other business. However, upon their arrival in Suriname, it turned out that these options were not possible, and they had to work in the sex industry to earn their ticket home and pay off their debt (e.g. plane ticket)⁶⁶. For example, one Dominican woman in the Sabajo area reported that she had paid USD 3000 to a “friend” who would arrange everything for her in Suriname. When she arrived at the airport, however, there was no-one to receive her or help her get established. Someone else brought her in contact with the cabaret owner, and now she is in the interior.

While interviews suggest that some women in cabarets in the Sabajo area were deceived when coming to Suriname, there was no evidence of bonded labor. The interviewed women said that they were able to leave and go to other places if they wanted to⁶⁷. They also reported that their passports had not been taken from them.

Figure 10. Number of Women in the Sabajo SSM Areas Performing Specific Jobs/functions (N=34)

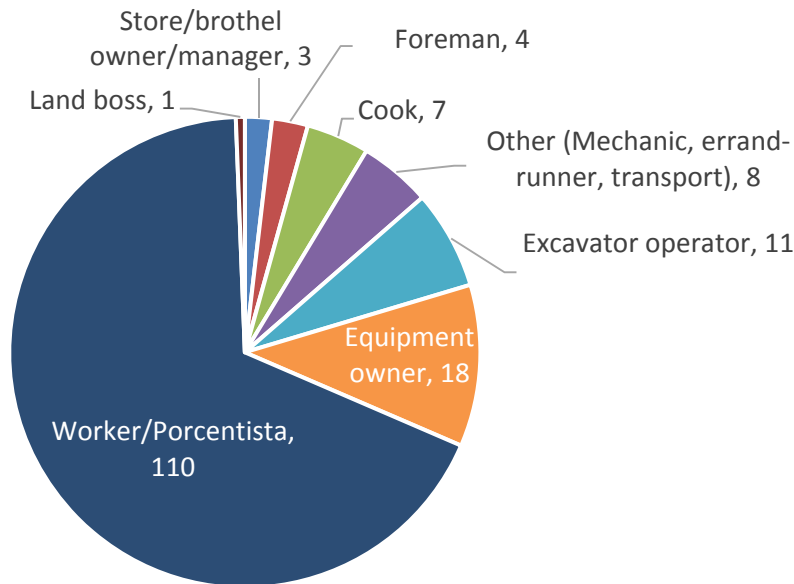


⁶⁶ Based on stories from five different women in the Sabajo area.

⁶⁷ Confirmed by three different CSW in different cabarets. Since the interviews were conducted, at least two women moved to different cabarets in other mining areas.

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Figure 11. Number of Men in the Sabajo SSM Areas Performing Specific Jobs, N=162



In earlier research with CSW in the gold mining areas, no evidence was found of human trafficking or deception of women coming to Suriname (Heemskerk, 2017; Heemskerk and Duijves, 2012a, 2012b). All women interviewed for these studies, mostly Brazilians, reported that they had traveled to Suriname knowing that they would be working in the sex industry, and they felt free to leave whenever they wished.

Another issue faced by CSW is the lack of security and law enforcement in the case of violent customers. Paramaribo clubs have bouncers that can remove unruly clients. In the forest, the cabarets have no bouncers and the nearest police post cannot easily be reached⁶⁸, so the women are largely on their own. One interviewed cabaret owner reported a problem with an aggressive client that occurred the night before the interview. This survey did not systematically research (gender-based) violence in the Sabajo SSM areas, and is unknown how common the problem is.

4.2 Small Scale Mining Process

4.2.1 Land Bosses

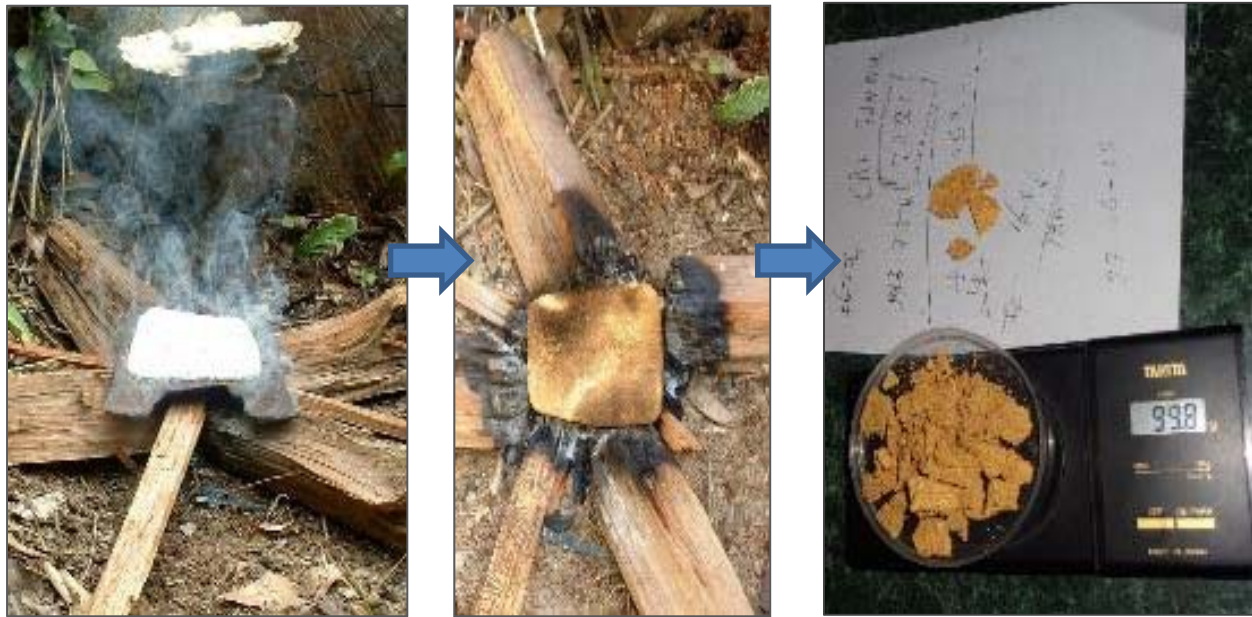
In the Suriname SSM sector, it is common practice and accepted in SSM areas that gold miners pay traditional owners of the land or legal concession owners a “concession fee”, which typically corresponds to 10 percent of earnings. These persons are referred to as land bosses. This system was probably introduced from Brazil, where the same system is used. In Suriname, traditional land claims have not been demarcated and the various Maroon and Indigenous groups do not have legal rights to the lands that they have inhabited and used for many generations. Nevertheless, the various ethnic groups generally have a clear understanding of what lands belong to what group, clan, or family, and these claims are typically accepted by gold miners. Local area inhabitants who are mining on family or clan land usually do not pay to a land boss.

⁶⁸ The nearest police post is at Brokopondo Centre, at about 1 ½ hr. driving from the Sabajo area. Most women do not have transportation so they would depend on other people to bring them to the police post, and pay for the ride.

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In order to make sure that equipment owners really pay their 10% dues, the equipment owner or his trustee will be present each time that a mining team is washing and burning gold. For example, using a hammer mill, the team may wash the mill and collect the gold-mercury amalgam every week. Working with a hydraulic system, it usually takes somewhat longer (2-4 weeks) before the team will wash the gold and count production. This process of gathering, washing and burning the gold (BR: *despesca*, SUR: *jit*) will take a couple of hours. At this time, the equipment owners are obliged to call the land boss to oversee the process, and make sure the gold miners do not hide their earnings from him. After the gold-mercury amalgam is burned –usually in a gold pan– the equipment owner or a representative will weigh it on a scale and pay the workers (20-30% depending on the system) and the land boss (usually 10%) their shares (Figure 11).

Figure 12. Burning the Gold-Mercury Amalgam and Dividing the Proceeds



It must be understood that the land boss system has no legal basis under Suriname law. Many land bosses have no legal title to the land they control. Nevertheless, the land boss system is generally accepted in the Suriname SSM sector, and provides a sense of clarity and (perceived) legality. That is, the land boss is expected to ensure that no-one bothers “his” equipment owners to demand money, and that other SSM do not infringe upon the area of his protégées. Some of the more active land bosses play an instrumental role in dividing the area and mediating conflict. If the land boss decides that an equipment owner or worker needs to leave because he or she creates too much trouble, for example, this order will generally be followed. Even though the practice is illegal, the OGS does not interfere with the land boss system, unless there is a dispute. The land bosses did not mention OGS, and during the validation meeting it was mentioned that there were no problems with OGS.

In the Sabajo area, there are two persons acknowledged as land bosses, F. and M. (Box 1 and 2). There used to be another land boss, a Paamaka man named Gayons, but he has left the area. Currently, the money that is collected is not delivered to, or shared with, the traditional authorities, nor does it compensate or benefit the Kawina community at large. In interviews, both F. and M. emphasized that they do not want

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trouble in the area and value and peaceful coexistence with Newmont – each party working and managing its own parts of the Sabajo area.

Box 1. Land boss 1

F. traces his ancestry to the community of Morico⁶⁹ in the lower Commewijne River area⁷⁰, but is closely related to some of the Kawina Ndyuka (i.e. cousin/uncle). His family has been in the wood business in this area for a long time; his grandfather had large logging concession and his father worked for the National Forest Service (*Dienst's Lands Bosbeheer* – LBB) in this area. As a child, he often went to the upper Commewijne River area with his relatives, and heard the stories about the area history and places where gold can be found.

F. started prospecting for in the Commewijne watershed area in 1996. He prospected along the Tempati creek, the Kleine Commewijne River, and different tributaries⁷¹. In 2002, F. obtained a small-scale mining concession (200 ha) in the Tempati Creek area, near the Mauritius creek, but this concession has expired. F. reports that in 2008, he obtained a 4095 ha gold mining concession for an area downstream from Santa Barbara, which was renewed in 2012⁷². By his own account, this concession includes the plains of the Santa Barbara area⁷³. It has not been possible to verify this claim as documentation was not provided, and information from the website of the Geology and Mining Department (GMD) does not provide the personal names of concession title holders (only company name)⁷⁴.

In 2008, after he obtained his concession, F. started his own mining operation in Santa Barbara and began collecting land boss money in this area. In 2009/10, a couple of Brazilian SSM operations asked F. for permission to work in this area, and also started mining at Santa Barbara –paying to F.. New operations continue to arrive in Santa Barbara, and in case of the Brazilian operations, always through F. or M (land boss 2).

Land boss F. only collects money from Brazilian gold miners, not from the Kawina equipment owners. The Brazilians suspect that F's concession is not really at the location where they are working, but they have to pay to someone anyway, and they do not really care to whom. If F. would not be taking money there would be another person. Moreover, they do not object to paying because they do that everywhere, and it provides them with a (false) sense of legality (they paid so they have the right to be there). F. will also not allow others to bother “his” Brazilians. By paying they become his protégées.

In the past couple of years, F. has not been physically present at Sabajo due to health problems. Nowadays land boss fees are collected in his name by M, who also is land boss 2.

⁶⁹ The Morico creek is a tributary of the Commewijne River, near Stolkersjiver

⁷⁰ There does not seem to be consensus on where the diving line is between Lower and Upper Commewijne.

⁷¹ F. Francis, pers. com. 13/11/17

⁷² F. Francis, pers. com. 3 August 2017; F. Francis, pers. com. 19 July 2017)

⁷³ For this reason F. only exerts his position of land boss in the Santa Barbara area; not in Margo or with scattered mining operations in the Sabajo area.

⁷⁴ See the map of gold concessions produced by the GMD at <https://geologymining-sr.maps.arcgis.com/apps/webappviewer/index.html?id=b4d5dc592abe47a4bc927849c910e757>. There is a 4285 ha gold exploration concession just south of the confluence of the Tempatie creek and Kleine Commewijne Rivier, and north of the Newmont Exploration Concession (GMD nr 463./10) in name of a firm named “NV Frits Freema Mining Company” (GMD no 066/11). It is possible that this is the concession that was referred to by F. This must be verified.

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Box 2: Land boss 2.

M is a Kawina Ndyuka who grew up in Gododrai/Mapane. His family has a long history of resource use in the Upper Kawina area⁷⁵. The interior war broke out when he was nine years old, and he dropped out of school. During the interior war, for six years, his family hid in the forests of the Commewijne River watershed. After the Peace Treaty that ended the interior war was signed, the family moved to Paramaribo and M. went back to school, completing fourth grade and starting fifth. However, the family was poor so he quit school and started working. He worked for about two years at the market; pushing carts with merchandise and selling plastic bags. When he was about 16 years old he found an opportunity to go to the gold fields with a relative. He has worked gold ever since, with occasional breaks during which he involved in hunting and logging. M is an uncle of three of the Kawina equipment owners at Santa Barbara.

According to the interviews, M. first came to Sabajo/Santa Barbara in 2002, together with F.. M. had been mining in various other SSM areas and had gained a lot of experience in the SSM sector. M. left the area after a couple of months, to return in 2015, coming from the Tempati creek area. Since F's illness, M has been F's representative in Santa Barbara, and he assists F in collecting his land boss payments from Brazilian gold miners. Since about one year, M also collects concession fees from two newer Brazilian SSM operations in Santa Barbara in his own name. He brought one of these equipment owners to Santa Barbara, thus establishing his patronage. In August 2017, M brought an excavator to the area to professionalize his own gold mining operation. His operation is currently active.

When asked about their position in the SSM areas, *kapiteins* Noordzee and Nijda indicated that if people want to work gold they should ask the *kapiteins* (traditional authorities) for permission first⁷⁶. The *kapiteins* have communicated this to the SSM in the area, but few respect this. Two Kawina equipment owners reported that they had obtained permission from *kapitein* Nijda (Pennenika) to mine in this area, but they do not pay the man a percentage share of earnings⁷⁷. Mostly, the traditional authorities have little grip on what happens in terms of SSM at Sabajo.

The interviews and validation session revealed an uneasy relation between the Kawina traditional authorities and Kawina gold equipment owners. A previous conflict about land boss payments is a source of this tension. This conflict started in 2009, when the Kapiteins from Kawina approached F and M to request their share of land boss proceeds⁷⁸. F. "gave" the Kawina Ndyuka several⁷⁹ Brazilian mining operations to collect percentage earnings from (i.e. he allowed them to be land boss for this group)⁸⁰. As another gesture to the Kawina, Mr. Francis donated metal roof sheets (*zinkplaten*) for the construction of holiday homes in the traditional Kawina area.

The Kawina equipment owners in the area collected the land boss money for a while and deposited it in a fund for Kawina community projects⁸¹. According to the Kawina equipment owners, they used the money in the fund for community projects in the Kawina area. Around New Year, they organized an event to bring

⁷⁵ R. Misiedjan, pers. Com. 05/08/17

⁷⁶ Kapitein Noordzee and Kapitein Nijda, pers. Com. 17 July 2017.

⁷⁷ The team of Cyrano Patha, Henk Albert Jopoi, Henk Noordzee, Marcel Johannes Misidjang (shared owners of one operation); and Brian Biaka (owning 2 operations – in Santa Barbara and Margo).

⁷⁸ F. Francis and R. Misiedjang, pers. com. 19 July 2017.

⁷⁹ Some say 4; others say 6.

⁸⁰ According to gold equipment owner H. Jopoi, they obtained four Brazilian SSM operations from F to collect concession fees

⁸¹ Henk Noordzee, pers. com. 16 July 2017; also H. Jopoi, pers. com. 3 August 2017.

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the people from the five communities together. The Kawina people had not come together for many years so this was an effort to reinforce their connection with one another⁸². They also bought a generator for one of the villages, and started building holiday homes near Java. The women's organization was also given money for projects. The idea was that the village fund could help the communities if there would be a specific problem.

There does not seem to have been a structure for consultation with the community about use of the village fund. During consultations, the Kawina *kapiteins* complained that they never received any of this money, and that the SSM do nothing for the community⁸³. On their turn, the Kawina gold miners accused the *kapiteins* of wanting to use the percentage incomes for their personal gain, rather than for the common good⁸⁴. Some of the gold miners distrust the traditional authorities to work for the common good⁸⁵.

In 2010, there was an eviction, and the Brazilian operations that paid to either F or the Kawina people left the area. After the eviction, F brought new Brazilians to the area. Because he brought these people, he collects land boss money from them. The Kawina traditional authorities and equipment owners, on the other hand, did not bring new Brazilian equipment owners to Sabajo. So they have now no-one to collect concession fees from.

The *kapiteins* are of the opinion that the gold miners need to pay them to “compensate the (Ndyuka) Kawina villages for the pollution” they cause in their traditional area⁸⁶. They complained that the Tempati creek is now polluted with sediments and mercury, so that one cannot catch fish as in the olden days. So they “want to either stop or regulate SSM”, said *kapitein* Noordzee⁸⁷.

Of the 18 SSM operations that are active in the Sabajo area, six reported paying a percentage share to a land boss (Appendix C); four to F. and two to M.. The Brazilian operations pay a fixed fee of 10 percent. The Suriname equipment owner (not a Kawina) pays 6-8 percent, but payment terms are flexible and when earnings are disappointing he is excused. The Kawina equipment owners do not pay a fee to a land boss.

None of the equipment owners outside of Santa Barbara reported paying to a land boss (Annex 3). A female equipment owner in Margo, Ms. Waterberg, conveyed that some years ago (~ 2014) Kawina gold miners had come to ask her for percentage-payment, and once again in 2016. However, she refuses to pay because “she is working to pay off her debts”⁸⁸. According to Ms. Waterberg, she also has been bothered by other people who have tried to move into her work location and/or push her out. On one occasion, she asked the OGS for assistance. Both parties had to come to OGS to settle the dispute. The OGS chair decided in her favor, and her colleague gold miner had to leave⁸⁹. This story exemplifies the role of OGS in resolving SSM-related conflicts, which it also played elsewhere (Heemskerk, Duijves and Pinas, 2015).

In conclusion, the reasons for not paying to a land boss included:

- 1) Being Kawina
- 2) Not acknowledging a land claim

⁸² H. Jopoi, validation meeting. 03/11/17.

⁸³ Kapitein Noordzee and Kapitein Nijda, pers. Com. 17 July 2017.

⁸⁴ For example, former gold miner H. Noordzee says: “The kapiteins just work for their own gain, not for their community.” (pers. com. 16 July 2017). Gold equipment owner J voiced a similar concern (pers. com. 3 August 2017). During the validation meeting, equipment J. indicated that there was jealousy, and that they preferred not to elaborate on this any further.

former gold miner H. Noordzee says: “The kapiteins just work for their own gain, not for their community.” (pers. com. 16 July 2017). Gold miner H. Jopoi voiced a similar concern (pers. com. 3 August 2017)

⁸⁶ Kapitein Noordzee and Kapitein Nijda, pers. Com. 17 July 2017.

⁸⁷ Ibid.

⁸⁸ Merigia Waterberg, 19 July 2017

⁸⁹ Ibid.

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- 3) The equipment owner was just established in the area and had not yet been visited by any land boss.
- 4) The equipment owner had established the operation outside of the reign of influence of land bosses (e.g. Km 34).

(see Appendix C)

In addition to the SSM operations, other businesses in the area also pay for the “right” to work in the area. Also this is common practice in Suriname SSM areas. A Brazilian-run cabaret in the Santa Barbara area reported paying a fee of USD 300/month to F. The cabaret owned by a Surinamese woman did not pay. A Brazilian-run cabaret along the road to base-camp pays monthly “rent” to the Chinese store owner across the street, who had constructed the location. The Cabaret and Chinese store along the main road do not pay money to any land boss. Appendix C provides more detailed data on the various equipment owners and businesses, and their payment to land bosses.

4.2.2 Equipment

4.2.2.1 Equipment Used

Small-scale gold miners at Sabajo have highly mechanized operations. Of the 18 surveyed SSM operations, only one worked without the use of an excavator. The equipment owner worked by himself with a small pump and a long narrow sluice box, washing the tailings (SUR: *bakasanti*) of other operations using a technique referred to as ground sluicing (SUR: *sumajé*). Of the other operations, five did not own an excavator, but hired one to work for them when needed. Prices for excavator rental in the area varied; from 4-5 g Au/hr. to 6-7 g Au/hr. One equipment owner reported that a befriended equipment owner provided excavator services for him for free.

Three of the five equipment owners who were paying for excavator rental, were in the process of buying one. Two of them reported that they could take their excavator to the gold fields after completion of a first installment of, respectively, USD 25,000 and USD 10,000. By the time of the validation meetings, in November 2017, at least one of these excavators had already been brought to the area.

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Table 3. SSM Equipment Present in the Various SSM Sections of Sabajo, With Additional Equipment Currently in the Area But Not Operational (E.G. Because It Is Broken But Fixable) in Brackets.

Area Name	# Operations	# Excavators	# Hammer Mills	# Sluicing Sets	Sumajé
Santa Barbara	13	10	8 (5)	10 (7)	1
Margo	3	4	5	2	0
Km 34	1	1 (1)	0	1	0
Polaco	1	1	0	1	0
Total in Sabajo	18	16 (1)	13 (5)	14 (7)	1

SSM operations in the Sabajo area work either with hammer mills or with sluicing equipment, and some operations have both types of equipment in different places. The hammer mills are used to process rocky material, often on the slopes of hills, while sluicing operations tend to target the finer alluvial materials in the stream bed valleys as well as tailings in locations where people mined (and milled) before. The lay-out of a sluicing operation is portrayed in Figure 12, and the hammer mill is pictured in Figure 13.

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Figure 13. Sluicing Operation of Brazilian Equipment Owner at Sabajo



Source: Image taken by Social Solutions at Sabajo

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Figure 14. Line-Up of Hammer Mills



4.2.2.2 Toxic Substances Used

Virtually all SSM operations in Suriname use mercury to extract gold from the ore⁹⁰. Also in the Sabajo area, all interviewed gold operations reported using mercury. The exact amount of mercury that SSM operations use per mining cycle or per time period is difficult to estimate as it depends on many factors, including: the amount of gold in the ore (more gold=more Hg); coarseness of the gold (the finer the gold, the more Hg); whether or not the area has been mined before (amount of Hg left by previous SSM), and personal experience and judgment of the equipment owner or manager (ibid). In earlier work, the average Hg: Au ratio for Suriname SSM operations was estimated at 3.3 : 1 (Heemskerk et al, 2016).

Most mercury used in the SSM sector enters Suriname from abroad (Heemskerk et al., 2016). In 2006, the Ministry of Trade and Industry ruled that a license is required to import mercury. Since that date, no licenses for mercury import have been issued. This implies that all mercury entering Suriname from abroad enters the country illegally. Once mercury has entered Suriname, it is sold at locations in Paramaribo where ASGM get together, such as in “Little Belem” – a Paramaribo neighborhood where many Brazilians who are affiliated with the SSM sector come together. Mercury is sold in shops and on the streets by cab drivers and other mobile vendors. In May 2016, mercury sold for USD 100-110/Kg in Paramaribo.

Mercury recycling using a retort is rare in SSM operations in Suriname, and Sabajo is no exception. One equipment owner reported that he used a retort when they found a lot of gold (e.g. 2 Kg. a pit), but for the small amounts he finds at Sabajo he does not use it. A colleague conveyed that he did not like using the retort because it makes the gold hard to break and divide among the workers, a problem that has been reported in other locations (Heemskerk and Duijves, 2014). Only one out of 18 interviewed equipment owners reported use of a retort, but the existence of this appliance could not be verified.

Figure 15. Storage of Mercury by an Equipment Owner in the Sabajo Area



When asked how they stored the mercury in their camp, six equipment owners reported that they held the mercury in a bottle with some water on top. The water is placed on top to prevent evaporation. The remaining SSM operation representatives who could answer this question reported that they used a bottle without water on top (Figure 14). Several SSM representatives said that they sealed the lid with a piece of plastic. Two equipment owners reported that they had buried the bottle with mercury in the bush, one to prevent theft and the other one to keep it away from his children when they come visit.

The use of toxic substances other than mercury is rare. Among 15 surveyed mining camps, three camps reported occasional use of the insecticide Malathion. In one SSM camp, the camp inhabitants occasionally threw diesel around the camp to prevent snakes from entering. Two equipment owners reported using herbicides (one gramoxone, one unnamed) to keep the area around the camp free of weeds. Among those who used insecticides or pesticides around the camp, one reported that no protection was used while spraying, two reported the use of a nose cap, and one person reported placing a t-shirt in front of the face when spraying.

⁹⁰ See earlier work by the consultants (Heemskerk et al., 2016; Heemskerk and Duijves, 2014) for more detail on how SSM use mercury, when it is applied in the mining cycle, how SSM protect themselves, and mercury awareness among SSM

4.2.3 Economics

4.2.3.1 Fixed Costs and Investment

SSM as it is currently practiced in Suriname requires substantial financial investment. Not only does the equipment owner need to buy the processing equipment (e.g. hammer mill or hydraulic set), an excavator is also indispensable as the miners are going after the deeper gold which is more difficult to access. Consulted SSM equipment owners estimated the value of their machinery at between USD 9,600 (operation without excavator) and USD 249,000 (with excavator). The operations that do not own an excavator may have lower investment expenses, but they typically rent an excavator by the hour, thus increasing their variable expenses. Quoted expenses for excavator rental in the area varied between 4-7 gr Au/hr (~USD 128-224/hr), which is in line with what excavator operators ask in other Suriname gold fields⁹¹. One equipment owner paid the excavator owner who exploits an operation next to her 10 percent of her earnings to have his excavator work for her.

On average, the SSM operations reported an equipment value of ~USD 102,000 per operation. The total value of the mining equipment of the 12 SSM operations in the area that provided information about their expenditures exceeds USD 1 M (Appendix E). This amount only quantifies mining equipment and does not count in generators for electricity, electrical appliances (e.g. TV), living quarters, freezers, and so forth. These fixed expenses add an estimated additional two to five thousand dollars to the total fixed expenses per mining operation (Table 4).

4.2.3.2 Variable Costs

Apart from fixed costs, each SSM operation has variable costs associated with mining and processing the ore. These variable expenses include spare parts, food and wages for the workers, the fees of the excavator operator (usually a fixed fee rather than %), and fuel/diesel and lubricants. Fuel to keep the equipment running is in most operations the highest variable expense. With one exception, the results of the current survey indicated that an SSM operation burns between 15-40 barrels of fuel (1 barrel=200 l) per week (~3-8 thousand l.), depending on size of the operation and number of pieces of processing equipment in operation. The one exception was a Ndyuka man who was ground sluicing (Sur: *sumajé*) with a small, 3" pump that he operated on his own. This man estimated burning about 10 l. of diesel/day.

The large operations typically buy diesel (partly) on credit, at about 1000 SRD/barrel⁹² (~USD 135/barrel) at the time of the fieldwork⁹³. This is about equal to the regular price of diesel⁹⁴. To get the diesel to the mining area, fees of between USD 400 – 600 were cited, depending on the number of barrels transported.

Variable costs include the expenses for workers. In SSM operations, the equipment owner pays all expenses. In addition to the equipment, this includes the fuel, other operational expenses, food for the workers, building accommodation and bedding, and so forth. The workers pay for their own clothing and entertainment. Workers earn a percentage share of the extracted gold. Usually, when working with an excavator, the workers receive 20 percent of earnings, and the equipment owner takes 80 percent⁹⁵. Working with usually four to five persons in a team, this means that workers earn approximately 4-5 percent of extracted gold. Excavator operators usually earn a fixed wage: wages of between 100-120 gr/month were reported in the Sabajo area. In some cases the equipment owners work also as operator to save on this expense. Arrangements for cooks differ, and can be either a fixed

⁹¹ Based on experience from the researchers in different gold mining areas in Suriname.

⁹² One barrel = 200 liter

⁹³ One Brazilian equipment owner who bought all diesel on credit reported paying USD 5000 for 30 barrels of diesel, or 167 USD/barrel.

⁹⁴ In the same period, the price of diesel at gas stations in Paramaribo varied between 5.03 and SRD 5.08, equivalent to a little over 1000 SRD/barrel or approximately 135 USD/barrel.

⁹⁵ In the Sabajo area this divide of earnings was confirmed by different equipment owners.

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fee or a percentage share. In the Sabajo area, different equipment owners reported paying the cook: 40 g Au/month (2x); 5 percent of earnings; and 1 g Au per worker per week. A couple of equipment owners paid for security personnel. Cited fees paid to security staff included: USD 1000 per armed security person per month (3 guards); USD 1000/week for 3 guards; and 10 g Au (USD 330)/pp/day (2 persons, only on high risk days⁹⁶).

A rough estimate of average equipment owner expenses is presented in Table 4.

Table 4. Estimated typical expenses of SSM equipment owners in the Sabajo area.

Item	Typical cost
Equipment	USD 9,600-250,000 (Av: 108,000) value. Need to pay monthly payment and interest
Camp; sleeping arrangements, kitchen, freezer, TV, small generator.	USD 2,000-5,000
Workers	20% of earnings
Cook, monthly	~30-40 gr Au, or same % as workers
Operator, monthly	100-120 g Au
Spare parts	10,000-15,000 spare parts for excavator (not monthly); for other equipment 3,000-3,500 / 6,000-7,000, depending on number of equipment in use.
Fuel; diesel, lubricant, “telis” (lubricant for excavator)/month	USD 4,000-10,000 per cycle; 12000 USD/month (+ USD 1000 freight)
Excavator rental (if not owning one)	4-7 g Au/hr (USD 128-224/hr). Higher fees are paid in places where there is more gold.
Food, team of 10 persons (i.e. boss, workers, cook, and 1 or 2 extra)	Varying between SRD 1,200/month – SRD 12,000/month – USD 1,000/moth – USD 2,000-3,000 / month
Security	USD 1,000 – 3,000/ month

Gold miners indicated that given these expenses, they need to find at least 18 g Au per barrel of fuel⁹⁷ to break even. Oftentimes, however, gold miners earn less than that, and they make a loss. As a result, they may borrow additional money (see below), buy fuel for the next mining cycle on credit, and/or not pay the workers for that cycle to keep the operation going. During the validation sessions, gold miners were asked how it was possible to continue mining for gold, given the high expenses and seemingly low earnings. The most common response was that one has to keep hope; one trusts that soon the earnings will be better. Gold is a gamble, you can lose money one day, but it will be netter next time. It also was indicated that 2017 was a difficult year, but some operations had moved their equipment and the new working place looked promising⁹⁸.

⁹⁶ High risk days are mostly the days that gold miners wash the gold from the sluice box or mill. This happens typically once a week or bi-weekly, but can also be less frequent. On this day the operation is most vulnerable to armed assault because they bur and divide the gold concentrate, and the equipment owner may bring his share to Paramaribo to sell the gold and buy fuel and other supplies, and pay off debts. Armed security may accompany the equipment owner during his/her travel to the city.

⁹⁷ Gold miners typically express the profitability of a work location in grams of gold per barrel of fuel. Fuel expenses are the highest variable expenses.

⁹⁸ Equipmnt owner J. reported during validation meeting, 03/11/17.

4.2.3.3 *Loans and Debts*

4.2.4 Loans and Debts

Few gold equipment owners have sufficient financial reserves to buy new equipment or even buy the spare parts to fix broken equipment. Fuel to work a new pit is typically bought on credit, and paid back after the mining cycle is completed and the gold is counted. In addition, equipment owners borrow money or take out credit to buy lubricant, excavator lubricant, and spare parts.

Banks are typically not eager to provide loans to small-scale gold miners. Very few, if any, can present a decent business plan and many SSM have nothing that can be used as collateral. For the Brazilian gold miners, an additional barrier to getting a formal loan is that they are foreign and may not have legal residency. As a result, gold miners seek out informal financiers and buy equipment and other necessities on credit. SSM in the Sabajo area reported being indebted to equipment owners, fuel sellers, a private money lender, a gold buying firm, a firm that sells equipment parts, and a car rental firm.

Because debts are a sensitive topic, it is difficult to obtain reliable information from all equipment owners about the amount that they are indebted to others. We did find that without exception, all SSM equipment owners in the area had debts; most often to equipment retailers. Debts ranged from ~USD 2,000 to ~USD 200,000. For eight mining operations from whom data could be obtained, the average debt was reported to be approximately USD 63,000.

Because gold miners purchase so much on credit, they often buy their items from the same vendor. For example, food supplies are always bought at the same Chinese supermarket; spare parts are always bought from the same equipment seller, and fuel is obtained from a specific seller. The anticipated sales serve as an incentive to give credit. One equipment owner reported that he obtained advances from a gold buying shop, because he always sells his gold to the same buyer.

Particularly for operations that are working on the edge of making a gain or loss, not recovering the expected amount of gold translates into further debts and/or failure to pay existing debts. Failure to timely pay debts, in turn, results in an additional fine or confiscation of the items that have been placed as collateral: often a house, plot of land, or car. See the examples of Mr. X and Mr. Y. (Box 3 and 4)

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Box 3

Equipment owner X owns two excavators, one of which is broken. Neither one of the excavators has been paid off; the remaining credit on the operational excavator is USD 35,000, and for the broken excavator he still needs to pay the vendor USD 4,000. Around January 2017, X bought 20 barrels of fuel on credit (= SRD 20,000). But before he could complete his mining cycle, he was notified by Newmont that he had to move his operation immediately because he was damaging an existing road, so he could not earn that money back. To move to a new location, he borrowed another 8 barrels of fuel. In order to earn that money back, he needed to start a new pit, so he took out another 20 barrels of fuel on credit. To his bad luck, the motor of the excavator broke and had to be replaced immediately; without excavator he cannot mine. Hence he borrowed USD 8,000 at a car rental firm, leaving his Toyota Highlux as collateral. The first counts from his new working location are meager; he earns barely enough to pay his variable costs and insufficient to pay off the debts. Moreover, because of heavy rainfall the pit was under water already four times, so a lot of fuel was burned just removing the water. X does not know how to get out of these debts.

Box 4

Equipment owner Y has been in the SSM business for a long time, working at different locations. About 1 ½ years ago, he started in the Sabajo area. Y owns three excavators, one of which has been paid off. For the other two combined, he still owns the equipment seller USD 82,000. His house and land serve as collateral for this loan. He also owes a fuel seller SRD 40,000 for diesel, plus SRD 30,000 for lubricant and Tellus (hydraulic oil). The most recent time he opened up the hammer mill, he found 362 gr Au (~ USD 11,946) in two weeks. This is insufficient to cover his operational expenses, which included for these two weeks:

- 20% of earnings payment for the workers (=USD 2389)
 - Excavator operator: 30 gr Au/pp/week, 2 operators (~USD 3960)
 - Cook: 1 gr Au/pp/week ~ 10 gr/week (~USD 660)
 - 30 barrels of fuel for that cycle (SRD 30,000 =~ USD 4,054)
 - Tellus and lubricant: SRD 12,000 (~USD 1622)
 - Transportation of fuel: USD 600
 - Security from CTU (Counter Terrorism Unit): 10 gr/pp/day for 2 days (~1320).
- TOTAL: USD 14,605

If the next counts are not better, Y will lose his Paramaribo home.

4.2.4.1 Service Providers

SSM service providers are individuals or businesses that deliver auxiliary services to gold miners in the mining area, but are not part of a mining team. For this study, cooks who were part of a mining team were considered workers of the team, and not service providers. Yet if someone would cook as an independent entrepreneur and sell that food to different teams, that person would be counted as a service provider. Typical service providers in SSM areas include transport providers, CSW, bar/brothel owners, mechanics, and independent excavator operators that can be hired by the hour. In addition, in some of the larger gold miner communities (e.g. Benzdorp) one might also find hair dressers, clothing shops, manicure/pedicure salons, music performers, restaurant and cantina holders, and hotel owners and staff.

In the Sabajo Project, which is a very small SSM area, such a broad selection of services is not found. There is only one store, which is located along the road to basecamp. The store is owned by a Chinese man, who is assisted by a Guyanese man and a Suriname (Saamaka) security man. The Chinese store owner has been at this location for nine years, and sells primarily basic groceries and user items. The items in the store can be paid in Suriname dollars, and prices are about the same as prices in Paramaribo; probably because the area can be reached easily from the city. A one liter bottle of beer can be bought for SRD 25 (~ USD 3.33; in Paramaribo it would be SRD 15 or USD 2); a large bottle of soft drink for SRD 15- (USD 2; in Paramaribo it would be SRD 9- or USD 1.20); and a bottle of water was sold for SRD 5- (USD 0.67).

The main SSM service providers are four cabarets and the women associated with these cabarets. Of the four cabarets, three are located in Santa Barbara, two run by a Brazilian woman and one by a Suriname woman. The fourth cabaret, which is run by a Brazilian couple, is located along the road to basecamp across from the Chinese store. Altogether, four Brazilian CSW (all in the cabaret along the road to camp) and nine Dominican CSW (all in Santa Barbara) were counted.

Arrangements between the CSW and the cabaret owners differ. In the cabaret owned by the Brazilian couple, the CSW do not pay for food and lodging. The idea is that the women entice the clients to buy drinks, and the cabaret makes it money from the sale of alcohol and other drinks. In this cabaret, the price of a large beer was SRD 60 (~USD 8), so more than twice the price in the store across the road. The price for a bottle of water was SRD 25- (USD 3.33), and 1.5 L soft drink was sold for SRD 40- (USD 5.33). Also in the cabarets owned by Brazilian women in the Santa Barbara area, the CSW do not pay for lodging. The prices for drinks in this cabaret were slightly higher than those in the cabaret along the road, and listed in gram of gold. For example, a pack of 12 small beer bottles (33 ml) was sold for 1 g Au (~USD 34). In the Cabaret run by the Suriname (Saakiki Ndyuka) woman, the CSW paid 1 gr Au/week for lodging, food and drinks.

CSW in the SSM areas typically get paid in gold. Consulted Dominican women reported earning 1 gr Au (~USD 34) for a short stay (20-30 min.). It is unknown if the Brazilian women in the Sabajo area earned the same. The quoted price is fairly low as compared to prices that have been reported in other areas. This may be related to the close distance to Paramaribo or to the fact that the gold business is not doing well, and hence gold miners have little pocket money to spend. In 2016, Brazilian CSW who were interviewed by the consultant in the Benzdorp general area, asked 3 g Au or €50- (they are along the French Guiana border) for a short time (30 min.), with some room for negotiation. The price for the entire night was 8-10 g Au. In 2011, based on interviews with CSW in cabarets throughout the Suriname interior, reported short-stay prices were 1.5-5 g, and 8-10 g for an entire night (Heemskerk 2017).

4.2.4.2 *Small Scale Miners' Earnings*⁹⁹

In 2016, based on interviews with gold miners in different mining areas of Brokopondo district, it was calculated that SSM laborers typically earn between 20-30 g Au/month (Heemskerk et al., 2016). At the average price of 33 USD/g Au paid by buyers in Paramaribo (in July 2017), this suggests monthly earnings per miner of 825 USD. In 2002, the Cooperativo de Garimpeiros Suriname (COGASUR), a (no longer existing) interest organization for Brazilian SSM in Suriname, estimated that the average Brazilian miner earned between USD 500 and USD 1500 a month (Healy and Heemskerk, 2005), which compares reasonably well with the 2016 estimates. Results of an SSM survey conducted in 1998-99 found that the largest share of surveyed gold laborers in a mining area along the Tapanahoni River earned between 20 and 40 g Au/month, at the time the equivalent of 186-373 USD/month¹⁰⁰ (Heemskerk, 2000).

At Sabajo, gold miners were not asked about their personal earnings because the interviews were conducted with the equipment owners, not with individual gold miners. Nevertheless, based on the two most recent gold counts, days worked, number of workers for that count, and the worker's share, an estimate of "typical" SSM earnings in Sabajo was calculated. Based on reporting of equipment owners, it was calculated that in the month prior to the interview, gold workers had earned between 6.4 g Au (USD 206) and 36.7 g Au (USD 1173)/month, if working 6 days/week during the entire month. The median earnings were 15.3 g Au (USD 488)/month, and the average came at 17.8 g Au (USD 570)/month, if working six days a week. These figures are similar to the above cited calculations from other areas. Because the workers do not pay for food, shelter, operational expenses, and taxes, the 18 g Au/month is the net amount that the worker can take home.

By comparison, an unskilled construction worker in Paramaribo who has been trained on the job earns about 100 SRD/day, which would translate to USD 320/month (working 6 days/week) or about two-thirds of median gold mining earnings. A more experienced or certified construction worker earns 150-200 SRD/day, or approximately USD 480-640/month, which is about equal or slightly higher than the "typical" gold miner. Gold miners, however, have the hope that in a lucky month, they might earn double or triple this amount.

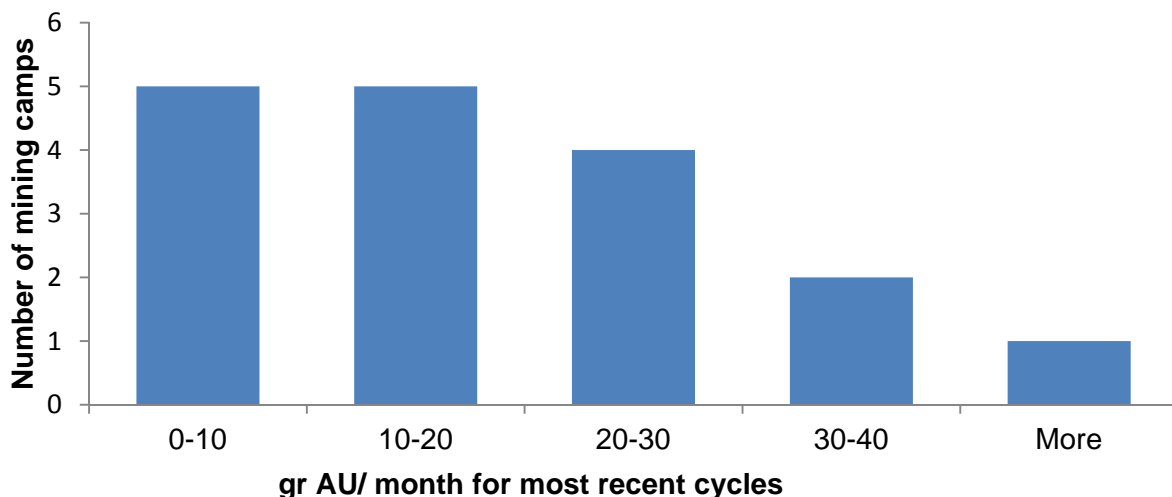
SSM Survey estimates are probably higher than real earnings, because SSM operations typically lose many productive days due to broken equipment or logistic problems (e.g. too much water in the pit, a broken dam). Prior calculations show that mining operations are not productive about 50 percent of the time (Heemskerk et al., 2016). Keeping this estimate in mind, actual SSM earnings may be about half of the earlier quoted estimates, which would be an average of 9 g Au/month (USD 288/month) (Figure 15).

⁹⁹ This section provides an estimate of SSM workers' incomes. In order to calculate the earnings of the equipment owners, one would need a more in-depth study of the exact expenses per camp over a period of ~3 months, as well as the earnings. Such in-depth economic research was not performed.

¹⁰⁰ At the time of the 1998-99 survey, the price of gold was on average USD 9.32/gram Au. At the time of the present (2017) survey, gold miners in Paramaribo received about USD 32/gram Au. Hence with current gold prices, the 20-40 gram Au/month would be worth USD 640-1280.

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Figure 16. Extrapolated SSM Workers’ Incomes in Sabajo, in the Month Prior to the Interview, by Operation



4.2.4.3 Selling Gold

Information on where the SSM equipment owners sold their gold was not collected. Based on interviews in many other SSM areas, it can be assumed that persons working in the SSM sector sell their gold to one of the certified gold shops in Paramaribo.

At present, six firms in Suriname have a gold buying and export license, and three other firms only have a gold buying license (Heemskerk et al., 2016). Those without an export license sell to one of the licensed exporters. The gold buyers purify the gold that is offered for sale using a burner, oven and/or borax. They determine the purity of the gold with a water density test¹⁰¹. After purification, testing and weighing, the buying house pays the gold miner the actual spot price, compensated for the purity, minus 6 – 7%¹⁰². The reduction is composed of 2.75% royalty to the Central Bank of Suriname, license duty and statistical fee (*consent en statistiekrecht*; 1.5%), fee to Kaloti (gold mint house) (0.25%), expenses (processing, transportation, administration; ~1.5%), and profit margin of the buying firm (~0.5%):

Gold price received by ASGM = (LBMA spot price * % purity) – 2.75% royalty – 1.5% other fees to government – 0.25% to Kaloti – 0.5% buyer’s profit margin

On August 07, 2017, prices of gold at the various gold buying houses ranged from USD 33.50/g. gold to USD 34-/g. gold. At that day, the London Bullion Market Association (LBMA) Gold Price was USD 40.45/g. gold.

¹⁰¹ Suriname gold they are offered for sale is on average 92% pure gold and 8% impurities (other metals etc). However, a consulted gold buyer reported that gold from specific locations in Brokopondo can be up to 98% pure.

¹⁰² The three consulted buying houses reported deducting 6%; 6.25%; and 7% to cover expenses

4.3 Small Scale Mining in the Local Context

4.3.1 Natural Resource Use

Gold miners were asked about their reliance on natural resources to feed the camp. Of the 16 surveyed SSM operations, 10 reported getting all their fish and meat exclusively from Paramaribo. In four camps, one or more inhabitants hunted occasionally; once or twice a month or even less. Only in one camp, the researchers encountered an active hunter, going out at least weekly. Most gold miners who also hunt are Kawina people; they reported to have a long history of hunting in this area, so they are not afraid of getting lost and know the best places for success. One Brazilian man reported hunting. Reported game included tapir (*Tapirus terrestris*), agouti (*Dasyprocta sp.*), paca (*Cuniculus paca*), deer (*Mazama sp.*), peccary (*Tayassu pecari* and *Pecari tajacu*), and forest birds such as the Black Curassow; *Crax alector*). Occasionally people also found turtles or armadillos.

In five camps people fished occasionally, and in two other camps fishing occurred more regularly; in one case even daily. People who fish regularly typically do not fish “actively”. They throw out a net and go check it at lunch time or in the evening. Most caught fish include Anjoemara (*Hoplias aimara*), piering (sub-family: *Serrasalminae*), koebi, Tiger fish (*Hoplia malabaricus*), Krobria (*Cichlasoma bimaculatum* and *Krobria guianensis*). Many camps do not have a freezer, so everything needs to be eaten immediately.

Like fish and meat, vegetables are mostly obtained from Paramaribo, although there is some planting around the camps. In two camps, both operated by Kawina people, the camp inhabitants planted most of the vegetables they consume. In the Margo area, a Kawina man has a garden plot (~ 20*20m) about 5 min walking from the camp. Here he plants different varieties of pepper, *sopropo* (*Momordica charantia*), okra, various types of leafy greens, water melon, pumpkin, sugar cane, long beans, and cassava (See photos Annex 3). Most is eaten in the camp but when he has a surplus he takes it to his wife. Another Kawina man, in the Santa Barbara area, also plants quite a number of vegetables and does not use pesticides. He named sweet cassava, leafy greens, pepper, *sopropo*, okra, and eggplant. He either uses the produce for his own consumption or shares some of it with others.

These camps are the exception. In other camps, the majority of vegetables come from Paramaribo. In most Brazilian camps, women plant a couple of easy growing crops around the camp area to supplement what they buy from the city. They usually have cassava, pepper, herbs (e.g. lemon grass, mint), and possibly some leafy greens and long beans.

4.3.2 Infrastructure and Service Use

4.3.2.1 Drinking Water

For drinking water, all Brazilian SSM camps relied on a water well. Four of the Kawina camps and one other Suriname operation also used a water well (Figure 16). Wells are typically dug with an excavator, and covered with plastic or wooden planks to keep leaves and dirt out. A well may be shared among befriended or related equipment owners. Several camps used both well water and rain water. Four Suriname mining operations did not have access to a well. They relied on rain water or creek water for drinking.

Figure 17. Shared Drinking Water Well for Two Brazilian Mining Camps



4.3.2.2 Sanitation

Once mining camps have established themselves in an area, they usually build some kind of sanitary facility. The typical 'outhouse' consists of a hole dug in the ground with an excavator. Wood beams are placed across the pit, so that people can stand on them (Figure 17). Once the pit starts to smell bad, they will cover it with sand.

Two older mining camps and three newly established operations did not have any toilet facilities. The miners in these camps would go into the forest to defecate, digging a small hole with a machete. In doing so, they would make sure to stay clear of creeks. In one Brazilian camp, the gold miners reported that they had an outhouse, but no-one used it. They used the forest instead.

Figure 18. Toilet facility for an SSM camp in the Margo Area



4.3.2.3 Garbage Processing

In the absence of garbage collection services, SSM have to develop their own method of processing garbage. All consulted mining operations reported that they had dug a hole in the ground with an excavator to dispose of garbage. Usually they first place the garbage in a black bag, and when it is full the bag is thrown in the hole. In some operations, the respondents conveyed that they would burn the garbage in the pit, while other gold miners said they did not burn but covered the pit with sand when it had filled up. In one camp, the gold miners said that they buried organic waste in the forest.

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4.3.2.4 Medical Services

The nearest public health post to the Sabajo area is the Medical Mission clinic in Brokopondo Centrum, about 1.5 hours driving from the Sabajo area. Few people in the area, however, use this post. When they are ill or in need of medical care, gold miners typically seek medical help in Paramaribo city. In addition, some Brazilian gold miners conveyed that they traveled to French Guiana when they needed to see a doctor. For emergency cases, gold miners in the Sabajo area have relied on the Newmont health post at the basecamp. Requests for health assistance from gold miners are rare. So far in 2017 (January-October), there have been four cases of gold miners seeking medical assistance at the Newmont health post, including one arm laceration, one leg injury, and one severe headache. The fourth case concerned a Brazilian man working in the lake area (i.e. not at Sabajo) who was brought to the Newmont gate. The people who brought him there had left, and he was very weak. The Newmont health worker could not help him and the man was advised to immediately go to the emergency service in Paramaribo. Newmont brought him to the Chinese shop along the main road to camp (Lin) to find transport to Paramaribo.

Despite the high risk working environment of SSM, 94 percent of surveyed SSMs had no form of health insurance. When falling ill, they pay out of pocket. None of the Brazilian gold miners were insured for medical expenses¹⁰³. Several Brazilian gold miners mentioned that they had obtained health coverage when applying for their residency documents, but once they had their papers and the insurance expired, they did not renew it. Those who did have health insurance mostly had some form of private health plan. One person reported having French health insurance.

4.3.2.5 Security Services

SSM not only exposes workers to occupational accidents, SSM also are vulnerable to theft and violent assault. One equipment owner accounted that a couple of years ago, when he worked elsewhere, he had been shot by criminals. They had left him for dead, and he was lucky that someone had found him and brought him to a medical post. He still suffered physically from the assault, walking difficultly, and feels traumatized.

Also the Sabajo area has not been spared from criminal attacks, though respondents reported that the situation had become better in the past years. Some years ago, the Chinese store and cabaret on the road to Sabajo base camp were assaulted by a group of criminals. They burned the place down and took the possessions of everyone present. The Chinese store owner and his Guyanese store assistant had escaped in the forest, but lost everything. More recently, in early 2017, a Brazilian mining camp at km 34 was assaulted. The criminals stole all gold, mobile phone and everything else of value.

The nearest police post for SSM operations in the Sabajo area is the station at Brokopondo Centrum. It would take the police about 1½ hr driving from there to the Sabajo area. Since they cannot rely on official law enforcement agents to protect them, some SSM operations hire their own guards or security forces. Gold miners pay significant sums of money for the services of heavily armed private security services. One Suriname equipment owner conveyed that he hired trained security guards at 10 g (~ USD 320)/pp/day. These persons come to the field when the operation is performing the final processing, and is ready to bring the gold to Paramaribo. They sometimes come with two persons, and they may stay overnight.

A Brazilian equipment owner explained that he paid USD 1000/week for 3 armed guards. These guards come for 6-10 days, around the time of washing the sluice box. They also drive with the equipment owner to Paramaribo.

¹⁰³ This is one reason to seek medical help in French Guiana, where one pays a small fee to see a doctor, but treatment is free.

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When he needs to pay for their transportation, the equipment owner pays USD 500 additionally. Moreover, in the week prior to the interview he also had to pay a “late pay fine”. Another Brazilian SSM equipment owner reported that he paid USD 3000 /month to have three armed security staff on site.

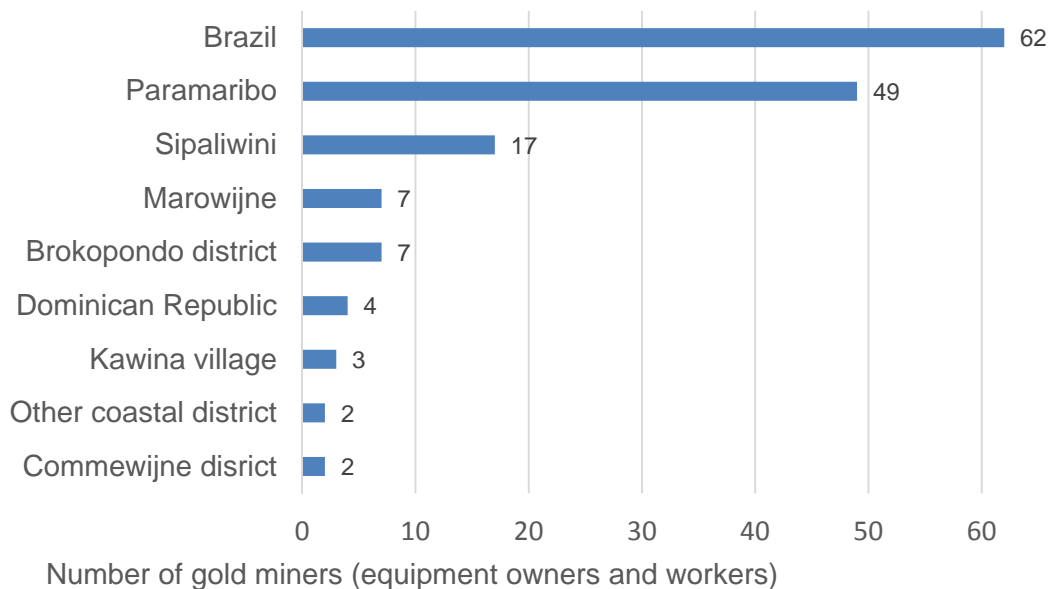
In addition, the Chinese store on the road to base camp used a local Saamaka person with a hunting rifle as a guard.

4.3.3 Relationships with Surrounding Communities

The small-scale gold miners in the Sabajo area have virtually no relation with the communities along the Afobaka road, including Afobaka itself. Of the persons whose place of birth could be traced, only seven were born in Brokopondo district (Figure 18). Of these seven individuals, five were still living in Brokopondo; in Balingsula, Klaaskreek, Boslanti, Dreipada and Nw Lombe. The persons who were born in a Kawina villages mentioned Pennenica and Mapane as their birth villages. They were living in Paramaribo at the moment.

All but one equipment owners reported that they or their workers never visit the Afobaka communities to buy supplies or socialize. Only the few workers who were from these communities would go there to be with their families when they left the SSM area. People who rarely (once every couple of months) visited Afobakka or one of the nearby communities had done so to buy fuel or supplies if they suddenly run out, or to get a taxicab to Paramaribo or for entertainment. Generally, all fuel and supplies are bought in and around Paramaribo.

Figure 19. Reported Birth Village of SSM Equipment Owners and Workers at Sabajo (N=153)



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SMALL SCALE MINING SURVEY – SABAJO ESIA

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**APPENDIX A
CONSULTED SMALL
SCALE MINING
STAKEHOLDERS**

SMALL SCALE MINING SURVEY – SABAJO ESIA

Person	Function	Date	Location
Henkie Jopoi and workers	Equipment owner; knowledge of SSM history	Jun-25-17; Jun-30-17; and 03-Aug-17	Santa Barbara and Paramaribo
Heliante (Hille)	Cabaret Owner	Jul-24-17	Santa Barbara
Camila (Br)	Cabaret Owner	Jul-24-17	Santa Barbara
Leidy	CSW	Jul-24-17; Jul-30-17	Santa Barbara
Orfeo (camp Van Troon) and workers	Operation foreman	Jun-24-17	Margo
Winston Dju (camp of Brian) and workers	Operation foreman	Jun-24-17	Margo
Cleonice (Br)	Cabaret owner	Jun-25-17	Santa Barbara
Cristao Carvalho Silvo (Br)	Equipment Owner	Jun-30-17	Santa Barbara
Luis Carlos	Equipment owner	Jun-30-17	Santa Barbara
Brian Biaka and workers	Equipment owner	Jul-01-17	Santa Barbara
Evelin	CSW	Jul-01-17	Santa Barbara
Bonifacios (Boni)	Equipment owner	Jul-01-17	Santa Barbara
Kivia (wife of Loiro) and workers	Wife of equipment owner	Jul-01-17	Santa Barbara
Tom Wabe	Associate of equipment owner and knowledge of area history	Jul-01-17	Santa Barbara
Elvis Waterberg	Brother of equipment owner and foreman	Jul-02-17	Margo
Jurno Van Troon	Equipment owner	Jul-02-17	Margo
Steven Misiedjan	Equipment owner	Jul-01-17	Santa Barbara
Toby Andre	Worker in camp Kastil (Broeder)	Jul-01-17	Santa Barbara
Iwan Kastil (broeder)	Equipment owner	Jul-02-17	Santa Barbara
Perdiepkoemar Baghwandien	Equipment owner	Jul-02-17	Km 34
Pedro Suarez (no real interview conducted)	Equipment owner	Jul-02-17	Km 34
Saki Misiedjan	Equipment owner	Jul-02-17	Santa Barbara
Pedro de Santos Silvo	Equipment owner	Jul-02-17	Santa Barbara
Polaco	Equipment owner	Jul-02-17	No name area
Peter Castello (Guy)	Assistant to Chinese store owner Lin Zhi Feng	Jul-02-17	Road to basecamp
Miriam and Nilton (Br)	Cabaret owners	Jul-01-17	Road to basecamp
Henk Noordzee	Share holder in SSM operation and knowledge of SSM history in the area	16-Jul-17	Paramaribo
Frits Francis	Land boss	19-Jul-17; 03-Aug-17	Paramaribo
Merigia Waterberg	Equipment owner	19-Jul-17	Paramaribo

SMALL SCALE MINING SURVEY – SABAJO ESIA

Person	Function	Date	Location
Kapitein Noordzee	Kapitein; knowledge of SSM history and arrangements between SSM and Kawina	17-Jul-17	Paramaribo
Kapitein Frans Nijda	Kapitein; knowledge of SSM history and arrangements between SSM and Kawina	17-Jul-17	Paramaribo
Ricardo Misiedjang (Toto)	Equipment owner and knowledge of area history	19-Jul-17; 5 Aug-17	Paramaribo
Kodjo Bedu-Addo	Social Responsibility Superintendent	19-Jul-17	Paramaribo
Stanley Douglas	Senior Security Supervisor	19-Jul-17	Paramaribo
Otto Sloan	Security Manager SA	23-Jul-17	Paramaribo
Dries Hugo	Security Manager Suriname	23-Jul-17	Paramaribo
Jose Ribeiro	Sabajo Project Manager	10-08-17	Paramaribo
Frank van Daal, equipment owner	Equipment owner	14-11-17	Paramaribo

APPENDIX B

GOLD EARNINGS

SMALL SCALE MINING SURVEY – SABAJO ESIA

Operation and Work Cycle	Nationality	Gold Produced (g)	# Days	# Workers	% per Worker	G Au/ Worker/ Month	USD /Worker /Month
Unskilled job, e.g. guard, cleaning							160-200
Operation 12	SUR	91	17	5	4%	6.4	206
Operation 11, cycle 1	SUR	103	14	6	3.3%	6.8	218
Operation 4, cycle 1	BRA	174	21	6	3.3%	7.7	247
Operation 11, cycle 2	SUR	265	30	6	3.3%	8.7	280
Average schoolteacher salary (Elementary school level)							270-350
Operation 6, cycle 2	SUR	249	30	5	4%	10.0	319
Unskilled construction worker (“handlanger”)							320
Operation 10	SUR	50.5	5	5	4%	12.1	388
Operation 4, cycle 2	BRA	294	21	6	4.0%	15.7	502
Operation 13, cycle 1	SUR	88	10	4	5%	13.2	422
Operation 13, cycle 2	SUR	99	10	4	5%	14.9	475
Skilled construction worker with certificate or extensive experience							480-640
Operation 1	SUR	362	14	8	2.5%	18.1	579
Operation 2, cycle 1	BRA	815	30	7	2.9%	23.3	745
Operation 2, cycle 2	BRA	540	20	7	2.9%	23.5	752
Operation 3	BRA	920	42	5	4%	24.5	785
Starting geologist at Newmont							933
Operation 7	SUR	100	10	3	10%	30	960
Operation 6, cycle 1	SUR	250	9	5	4%	33.3	1067
Operation 5	BRA	1100	45	4	5%	36.7	1173
University educated geologist at Newmont, average							1200
Operation 8	SUR	7	3	1	100%	63	2016

**APPENDIX C
PAYMENTS TO LAND
BOSSES**

SMALL SCALE MINING SURVEY – SABAJO ESIA

Area	Equipment owner	Security nr.	Amount	Pays to	Reason for Not Paying
Sta Barbara	Brazilian	N-SA8	10%	F	N.A.
Sta Barbara	Brazilian	N-SA7	10%	F	N.A.
Sta Barbara	Brazilian	N-SA10	10%	F	N.A.
Sta Barbara	Brazilian	N-SA10	10%	? ¹⁰⁴	N.A.
Sta Barbara	Brazilian	No number	10%	Toto	N.A.
Sta Barbara	Suriname Kawina	N-SA5	Not paying	N.A.	Equipment owner is Kawina
Sta Barbara	Suriname Kawina	N-SA6	Not paying	N.A.	Equipment owner is Kawina
Sta Barbara	Suriname Kawina	N-SA4	Not paying	N.A.	Equipment owner is Kawina
Sta Barbara	Suriname Kawina	No number	Not paying	N.A.	They are Kawina, and land boss
Sta Barbara	Suriname Ndyuka	No number	6-8%, depends on earnings	M	When earnings are poor, he is excused from paying
Sta Barbara	Suriname Ndyuka	No number	Not paying	N.A.	Very small 1-person operation, probably not worth the effort
Sta Barbara	Suriname Kawina	N-SA3	Not paying	N.A.	Equipment owner is Kawina
Sta Barbara	Cabaret – Brazilian	N-SA9	USD 300/moth	F	N.A.
Sta Barbara	Cabaret- Brazilian	No number	Missing	N.A.	N.A.
Sta Barbara	Cabaret- Suriname	No number	Not paying	N.A.	Relative of Kawina equipment owner
Margo	Suriname Saramaca	N-SA1	Not paying	N.A.	Do not feel the Kawina have right to collect % shares because this is not their concession
Margo	Suriname Matawai	N-SA1	Not paying	N.A.	
Margo	Suriname Kawina	N-SA2	Not paying	N.A.	Equipment owner is Kawina
KM 34	Suriname Hindustani	N-SA12	Not paying	N.A.	Just arrived at this location; no-one asked yet
Km 34	Brazilian	N-SA13	Not interviewed because was leaving the location		
New area	Brazilian	No number	Not paying	N.A.	The local people do not own this place. Also, he just started here; no-one asked him.
Road to camp	Cabaret – Brazilian	N-SA11	8 g Au/month	Lin Zhi Feng (Chinese store owner)	N.A.

¹⁰⁴ Wife was interviewed; she does not know the name

APPENDIX D
IMAGES OF PLANTING BY
INHABITANTS OF MINING
CAMPS IN THE SMALL
SCALE MINING AREAS

SMALL SCALE MINING SURVEY – SABAJO ESIA

Garden plot maintained by a gold miner in the Margo area



Cassava



Plant bed



Pepper



SMALL SCALE MINING SURVEY – SABAJO ESIA

Cassava



Aloe Vera



Pepper



Vegetable



APPENDIX E

VALUE OF EQUIPMENT

SMALL SCALE MINING SURVEY – SABAJO ESIA

SSM operation	Equipment				Est. Current Equipment Value	Total in USD
	Excavators	Hammer Mills	Hydraulic Sets (Complete)	Other		
1 – SR	3	3	0	1 water pump	~200,000 for excavators. 3x 12,000 USD for Mills (bought them at 18,000 USD)	240,000
2 – SR	1	5 (not operational now but are prepared for work)	3 (only 2 operational)	0	Excavator USD 70,000. Hydraulic pumps and hammer mills ~ 20,000 USD/piece	230,000
3 – BR	1	0	1	0	Excavator 75,000 USD; Hydraulic set 20,000.	95,000
4 – BR	1	0	1	0	Excavator 80,000 USD; hydraulic set 25,000 USD	105,000
5 – SR	1	0	2	0	Excavator USD 50,000. 2 hydraulic sets together USD 50,000	100,000
6 – BR	1	0	1	0	Excavator USD 30,000; hydraulic set USD 20,000	50,000
7 – SR	1	0	1	0	Excavator 7 kg gold (~ 224,000). Hydraulic set USD 25,000.	249,000
8 – SR	0 (rents @ 7gr/hr)	0	1	0	Hydraulic set 300 gr (~ 10,000 USD) worth	10,000
9 – BR	1	0	1	0	Excavator USD 70,000; hydraulic set USD 20,000.	90,000
10 – SR	1 + 1 broken	0	1	0	Excavators USD 35,000 and USD 10,000 (broken). Hydraulic set USD 20,000.	65,000
11 – BR	1	0	1	0	~ 20,000 excavator and ~ USD 20,000 hydraulic set	40,000
12 – SR	0 (rents @ 10% of earnings)	2	0	0	Two mills together 20,000	20,000
13 – SR	4	10 (5 operational)	6 (not operational)	0	200,000 for 10 mills. Other values not quoted.	?
14 - SR	1 broken in Paramaribo; est, 15,000	0	1	0	Does not know for excavator; 15,000 for hydraulic set.	Est. 30,000

SMALL SCALE MINING SURVEY – SABAJO ESIA

	USD to repair					
AVERAGE 12 OPERATIONS						101,846 ¹⁰⁵

¹⁰⁵ This estimate would be somewhat higher when including the operation with missing data, (Nr. 13 in the list), since this operation included 4 excavators, and several mills and hydraulic sets.

**APPENDIX F
RESEARCH
INSTRUMENTS**

SMALL SCALE MINING SURVEY – SABAJO ESIA

A. Site Observation Sheet

SITE OBSERVATION SHEET		Site name:			
A. GENERAL		B5. In the past year, has this area been visited by people who have provided information about mercury?			
A1. Number of mining operations		<input type="checkbox"/> 1. Yes <input type="checkbox"/> 0. No >> B7			
A2. Number of excavators		B6. Please describe mercury awareness activities, incl. who provided the information			
A3. Number of supermarkets					
A4. Prices of bread/water etc.		<input type="checkbox"/> NA			
A5. Number of cabarets		B7. In the past year, has this area been visited by the Malaria Progr?			
A6. Presence of traveling salespeople. Describe kinds of goods and frequency of visits.		<input type="checkbox"/> 1. Yes <input type="checkbox"/> 0. No			
		C. GENDER & CHILD LABOR			
		C1. Observed frequency of child labor			
		<input type="checkbox"/> No obvious cases <input type="checkbox"/> One or two suspected cases <input type="checkbox"/> Other, describe:			
		C2. Describe kind of work performed by children under the age of 18			
A7. Nearest police post					
A8. Time to reach nearest police post					
B. HEALTH		C3. Estimated share of women in ASM population, incl. service sector			
B1. Nearest health post		<input type="checkbox"/> <5% of ASM population - incl. services - are women <input type="checkbox"/> 5-15% of ASM population are women <input type="checkbox"/> 15-25% of ASM population -incl. services- are women <input type="checkbox"/> >25% of ASM population are women			
B2. Time to reach the nearest HP with most common mode of transportation (h:min)		C4. What jobs (money earning) are performed by women in this area			
B3. Expenses to reach the nearest health post (USD)		<input type="checkbox"/> Equipment owner <input type="checkbox"/> CSW <input type="checkbox"/> Cook <input type="checkbox"/> Owner of bar/restaurant/cabare <input type="checkbox"/> Transport provider (AT V/Car) <input type="checkbox"/> Other: <input type="checkbox"/> Traveling saleswomen <input type="checkbox"/> Other:			
B4. Where do gold miners from this area typically go for health services? Rank the Health locations from 1 (most important) down.		C5. Number and nationalities of CSW in the cabarets:		Nr. CSW	Nationalities
<input type="checkbox"/> MZ Afobaka		Caberet 1 name:			Free condoms?
<input type="checkbox"/> MZ in home community		Caberet 2 name:			
<input type="checkbox"/> MZ in Brokopondo Centrum		Caberet 3 name:			
<input type="checkbox"/> Paramaribo					
<input type="checkbox"/> Other, namely:					

SMALL SCALE MINING SURVEY – SABAJO ESIA

Date (DD/MM/YY):		Interviewer:		FORM NUMBER				
Camp name: <input style="width: 150px;" type="text"/>		Work area: <input style="width: 150px;" type="text"/>		<input type="checkbox"/> Margo <input type="checkbox"/> Santa Barbara <input type="checkbox"/> Other, ni:				
PERSON CODE Record the name of every camp inhabitant A camp inhabitant is someone who regularly sleeps and eats in the camp, including persons who do not work, such as e.g. children.		(1.01) FIRST NAME/NICKNAME	(1.02) SEX	(1.03) AGE	(1.04) FUNCTION	(1.05) ETHNICITY	(1.06) BIRTH VILLAGE	(1.07) LIVING PLACE
			Man 1 Woman 2	Age of [NAME] In completed years	What is the job/function of [NAME] In this camp?	What is the ethnic affiliation of [NAME]? [NAME]?	In what village was [NAME] born? For persons born in Paramaribo, ask if the mother at the time lived in Paramaribo. If the mother only came to Paramaribo for delivery, record the name of the village where she went after delivery.	In what village/city does [NAME] reside mostly when he or she is not in the mining area? Only name the location where the person spends most time.
PC	FIRSTNAME	SURNAME	CODE	AGE	CODE TEXT (for 5, 6 of 888)	CODE TEXT (for 888)	VILLAGE/CITY NAME	VILLAGE/CITY NAME
01								
02								
03								
04								
05								
06								
07								
08								
09								
10								

SMALL SCALE MINING SURVEY – SABAJO ESIA

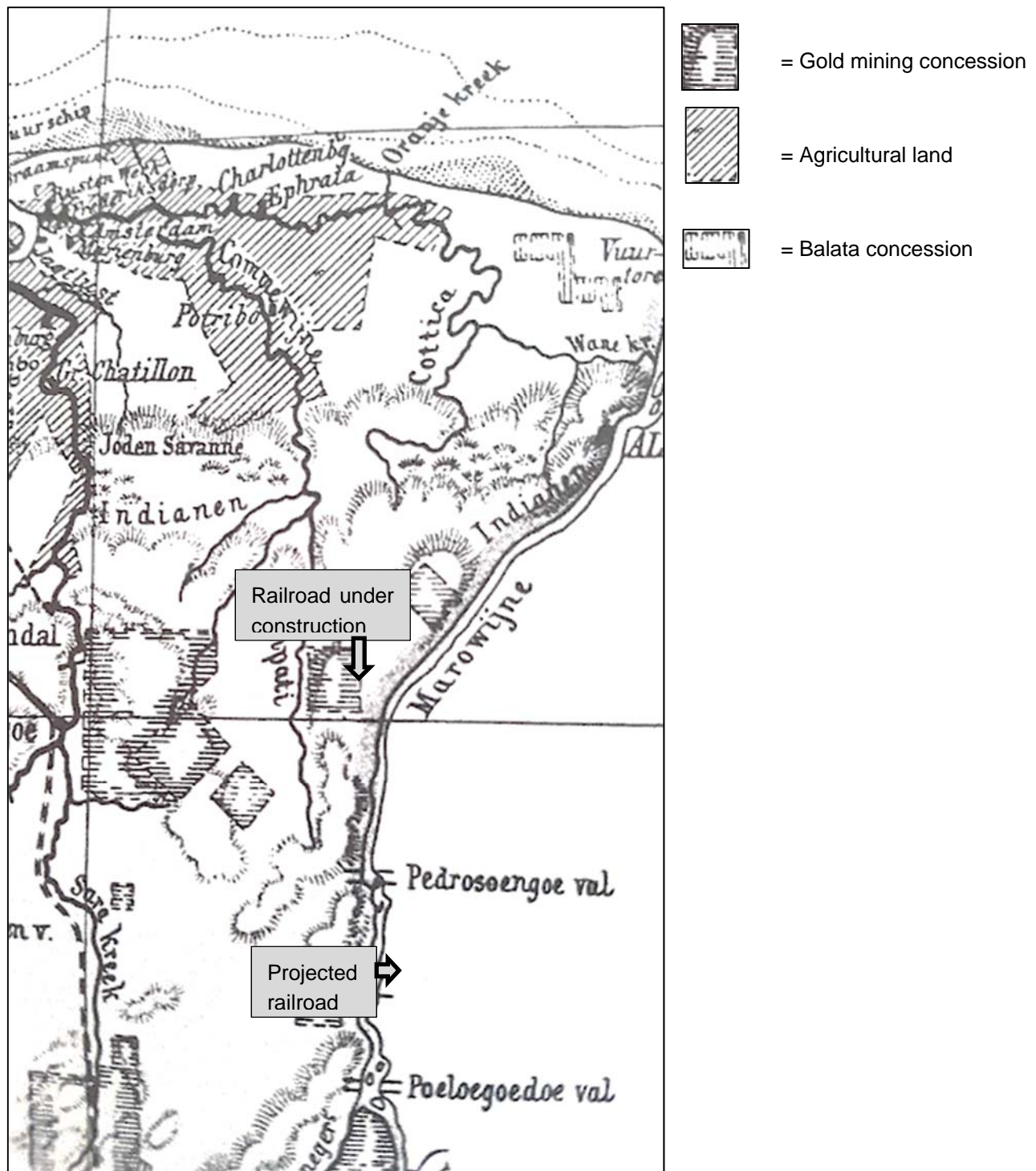
QUESTIONS ABOUT USE OF TOXIC SUBSTANCES	
(2.19) How is mercury stored in the camp? (visual inspection) <ul style="list-style-type: none"> <input type="checkbox"/> In a bottle/container without water on top <input type="checkbox"/> In a bottle/container with water on top <input type="checkbox"/> No Hg is stored <input type="checkbox"/> Other, nl: _____ 	(2.26) How do you characterize your contact with Newmont so far? <ul style="list-style-type: none"> <input type="checkbox"/> Very friendly <input type="checkbox"/> Some staff are friendly, others are not <input type="checkbox"/> Unfriendly/rude <input type="checkbox"/> Other, nl: _____ <input type="checkbox"/> NA
(2.20) Does the camp have a retort to burn gold? <ul style="list-style-type: none"> <input type="checkbox"/> No <input type="checkbox"/> Yes, is always used <input type="checkbox"/> Yes, but not systematically used <input type="checkbox"/> Yes, but not used 	(2.27) Please explain your answers above (2.26)
(2.21) Does the camp spray with insecticide, e.g. against mosquitoes/ants? <ul style="list-style-type: none"> <input type="checkbox"/> No, no spraying with insecticides <input type="checkbox"/> Yes, with Malathion <input type="checkbox"/> Yes, with _____ 	(2.28) How can Newmont improve its relation/maintain a good relation with the SSM?
(2.22) Does the camp spray with herbicide, e.g. against weeds/gras in the camp area? <ul style="list-style-type: none"> <input type="checkbox"/> No, no spraying with herbicide <input type="checkbox"/> Yes, with Gramoxone <input type="checkbox"/> Yes, with _____ 	
(2.23) When spraying with herbicide/insecticide, does the worker use any protection? <ul style="list-style-type: none"> <input type="checkbox"/> No, protection at all <input type="checkbox"/> Yes, t-shirt in front of nose and mouth <input type="checkbox"/> Yes, with _____ <input type="checkbox"/> NA 	
CONTACT WITH NEWMONT	
(2.24) In the past year, how often have you been in contact with Newmont staff? <ul style="list-style-type: none"> <input type="checkbox"/> Never <input type="checkbox"/> Just once or twice <input type="checkbox"/> At least monthly <input type="checkbox"/> At least weekly <input type="checkbox"/> Other, nl: _____ 	
(2.25) When you have contact with Newmont, with who do you speak? <ul style="list-style-type: none"> <input type="checkbox"/> Security <input type="checkbox"/> Social responsibility <input type="checkbox"/> Exploration team <input type="checkbox"/> Other, nl: _____ <input type="checkbox"/> NA 	

SMALL SCALE MINING SURVEY – SABAJO ESIA

FORM NUMBER <input style="width: 80%;" type="text"/>	CAMP NAME <input style="width: 80%;" type="text"/>										
(3.01) Where does the camp get fresh meat and fish? (multiple answers possible)	(3.07) How often do gold miners from this camp visit the Maroon villages along Afobakkaweg?										
<input type="checkbox"/> Paramaribo <input type="checkbox"/> Hunting <input type="checkbox"/> Fishing <input type="checkbox"/> Local sale, fixed location <input type="checkbox"/> Local sale, mobile sellers <input type="checkbox"/> Other, nl: _____	<input type="checkbox"/> Daily <input type="checkbox"/> At least 1x p week <input type="checkbox"/> Every month 1-2 times <input type="checkbox"/> Rarely <input type="checkbox"/> Never <input type="checkbox"/> Other, nl: _____										
(3.02) How often do camp inhabitants hunt?	(3.08) For what reason(s) do the gold miners visit the Afobakkaweg villages?										
<input type="checkbox"/> Daily <input type="checkbox"/> At least 1x p week <input type="checkbox"/> Every month 1-2 times <input type="checkbox"/> Rarely <input type="checkbox"/> Never <input type="checkbox"/> Other, nl: _____	<input type="checkbox"/> Health services/MZ <input type="checkbox"/> Buy food/supplies <input type="checkbox"/> Visit family/friends <input type="checkbox"/> Other, nl: _____ <input type="checkbox"/> Other, nl: _____										
(3.03) How often do camp inhabitants fish?	(3.09) How often do the gold miners from this camp visit Afobaka?										
<input type="checkbox"/> Daily <input type="checkbox"/> At least 1x p week <input type="checkbox"/> Every month 1-2 times <input type="checkbox"/> Rarely <input type="checkbox"/> Never <input type="checkbox"/> Other, nl: _____	<input type="checkbox"/> Daily <input type="checkbox"/> At least 1x p week <input type="checkbox"/> Every month 1-2 times <input type="checkbox"/> Rarely <input type="checkbox"/> Never <input type="checkbox"/> Other, nl: _____										
(3.04) Where do camp inhabitants get fresh vegetables?	(3.10) For what reason(s) do the gold miners visit Afobakka?										
<input type="checkbox"/> Plant/Garden <input type="checkbox"/> Paramaribo <input type="checkbox"/> Local sale, fixed location <input type="checkbox"/> Local sale, mobile sellers <input type="checkbox"/> (Hardly) eat fresh vegetables <input type="checkbox"/> Other, nl: _____	<input type="checkbox"/> Health services/MZ <input type="checkbox"/> Buy food/supplies <input type="checkbox"/> Visit family/friends <input type="checkbox"/> Sell gold <input type="checkbox"/> Other, nl: _____										
(3.05) Where does the camp get drinking water?	(3.11) How do the camp inhabitants process garbage?										
<input type="checkbox"/> Own put <input type="checkbox"/> Rain water <input type="checkbox"/> Creek <input type="checkbox"/> Other, nl: _____	<input type="checkbox"/> Burn <input type="checkbox"/> Compost <input type="checkbox"/> Throw on a pile behind/near the camp <input type="checkbox"/> Throw in a pit <input type="checkbox"/> Other, nl: _____										
(3.06) What sanitary services do the gold miners from this camp use?	Describe garbage situation:										
<input type="checkbox"/> Forest <input type="checkbox"/> Creek/River <input type="checkbox"/> Outhouse <input type="checkbox"/> Other, nl: _____	<table border="1" style="width: 100%; height: 100%; border-collapse: collapse;"> <tr><td style="width: 50%;"></td><td style="width: 50%;"></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>										

**APPENDIX G
MAP OF SURINAME WITH
GOLD MINING
CONCESSION IN THE
COMMEWIJNE RIVER
WATERSHED, ALONG THE
HEAD WATERS OF THE
SMALL COMMEWIJNE
CREEK, THE
APPROXIMATE LOCATION
OF THE SABAJO
PROJECT (DATE: 1905).**

SMALL SCALE MINING SURVEY – SABAJO ESIA



Source: Kietzmann, H. (1905). Kaart van Suriname. Size of the original: 27x43 cm. Topografische Dienst, Delft.