



# WORKSITE RESEARCH REPORT

PSI Vietnam | 2017



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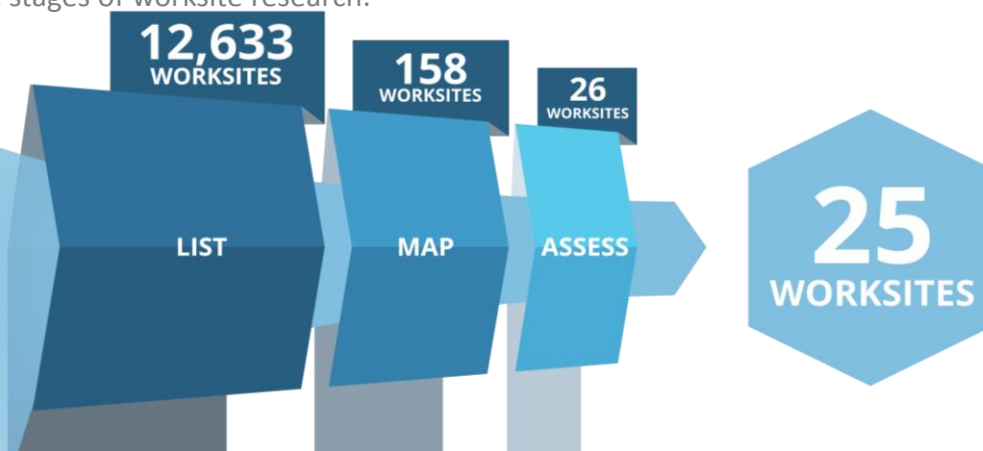
# EXECUTIVE SUMMARY

As malaria cases in Vietnam continue to decline, the remaining cases become harder to find and tend to cluster in specific geographic areas – particularly in and around forests – and in particular population groups, including people who spend time in or near forests. Worksites in forested areas, such as rubber plantations, are likely to have workers at risk of malaria as a result of exposure to mosquito bites and limited access to/awareness of preventative measures, or appropriate test-and-treat health care facilities. PSI used a three-step research process to identify and classify worksites in select districts of five high-burden provinces and to identify programming opportunities to ensure that the most at-risk workers have access to quality malaria care.

The research began with a listing exercise organized in partnership with provincial Departments of Health (DOH) and affiliated commune-level Health Volunteers to conduct a full census of all worksites in 28 districts across six provinces. The listing exercise identified 12,633 worksites, along with information about their ownership, activity type and workforce size. Using the listing results, PSI removed worksites with fewer than 50 workers based on the estimation that delivering onsite malaria care to worksites with fewer than 50 workers would not be logistically feasible or cost-effective. After removing smaller worksites, only 158 **out of the total 246 listed** worksites remained to be investigated further in five provinces included in the Greater Mekong Sub-region Elimination of Malaria through Elimination(GEMS) Program in 2017: Binh Phuoc, Gia Lai, Dak Lak, Quang Binh and Kon Tum.

The second step involved visiting the prioritized 158 worksites in 22 districts across five provinces to conduct a more in-depth mapping study. Interviews were conducted with worksite managers in order to learn more about known malaria risk factors, workforce structure, working hours, health needs, access to health facilities and interest in participating in a malaria program. **These results were analyzed to identify which sites were most at-risk of malaria in terms of the type of site, proximity to forest, and prior presence of malaria. Analysis of the mapping results yielded a list of 26 worksites to be considered to receive onsite malaria information and/or services.**

The third and final stage involved conducting program assessment visits on 25 worksites (one had closed) to better understand the different contexts and tailor program solutions to each site's specific needs. This report presents the findings from each of these research steps, concluding with general findings and PSI's next steps. The annexes contain additional information on the methodology and the lessons learned throughout the multiple stages of worksite research.





## BACKGROUND

Important gains in malaria control have been achieved in recent years in Vietnam. Malaria admissions and deaths declined by 90% and 85% respectively between 2000 and 2013.<sup>1</sup> Malaria transmission is perennial with two peak seasons: May through June and October through November.<sup>2</sup> Transmission is highest in rural, forested or forest adjacent areas in the central and southern regions of the country, along the Cambodian and Laotian borders.<sup>3</sup> **In 2015, the incidence of malaria in these regions were also significant, with the highest incidence of almost 2 per 1,000 people in Binh Phuoc and 1 per 1,000 people in Gia Lai.**<sup>4</sup> One out of every five of Vietnam's 90 million inhabitants live in high transmission areas (16 million people). Of these, one quarter or four million people, are estimated to live in high burden or border districts within the five provinces covered by PSI's "Strengthening Private Sector Malaria Case Management and Surveillance" program: Binh Phuoc, Gia Lai, Dak Lak, Kon Tum & Quang Binh.<sup>5\*</sup>

Research on worksites has been largely absent in Vietnam's malaria context. In order to address this gap in knowledge, PSI developed a comprehensive strategy to identify, map and assess all existing worksites in prioritized districts of the five provinces included in the GEMS Program. The research was conducted with a view to informing the design of effective worksite malaria programming including onsite malaria test and treat services as well as communication to improve worker motivation for test and treat behaviors.

\* Dak Nong province was originally included in the GEMS Program design, prior to the decision to focus on five provinces. Dak Nong province was removed after the listing phase of the research. Mapping & assessment phases were conducted in five provinces: Binh Phuoc, Gia Lai, Dak Lak, Kon Tum & Quang Binh.

## NATIONAL MALARIA STRATEGY

The most recent national data indicates that among 19,252 malaria patients served through the public sector in 2015, 10,868 cases were confirmed and only 3 deaths were reported, representing a 40% decline from the previous year.<sup>6</sup> **Preliminary estimates from 2016 suggest that confirmed cases may have fallen even further, by an additional 27.5%.<sup>7</sup>**

Vietnam's National Strategy for Malaria Control and Elimination (2011-2020) calls for reduced incidence in high burden areas and elimination by 2030, through increased coverage of the most at-risk individuals with quality diagnosis and effective treatment, increased engagement of the private sector, and other priority strategies outlined in the strategy document.<sup>8</sup>

## PRIVATE HEALTHCARE SECTOR

Multiple decrees highlight support for increased private sector contributions to facilitate elimination.<sup>9</sup> To date, malaria programming has focused on public sector channels. Malaria testing and treatment have been provided free-of-charge through public sector outlets at every level, including commune health stations (CHS) since 2003. Oral monotherapy was banned in

2013.<sup>10</sup> Available evidence suggests that the private sector plays an important role in the delivery of health services in Vietnam, particularly outpatient care.<sup>11</sup> Previous research has documented the important role played by the private sector with respect to specific health services and areas of the country, though not specifically related to malaria care.<sup>12</sup>

## AT-RISK GROUPS

In response to unprecedented donor investments and prioritization of malaria elimination by the Greater Mekong Sub-region (GMS) country governments, the prevalence of malaria is decreasing dramatically across the region. Nevertheless, transmission remains high in specific geographical areas and within key groups, particularly mobile and migrant populations (MMP), and communities of workers living in or working near forested areas where mosquitoes breed.<sup>13</sup>

MMPs have historically been considered key drivers of anti-malarial drug resistance in the GMS and thus remain high on the Ministry of Health's radar and the wider international public health community. These groups and areas are difficult to reach with routine health services for a number of interrelated reasons. Thus, targeted programming on worksites where MMPs and forest goers are largely represented, is critical to elimination.<sup>14</sup>

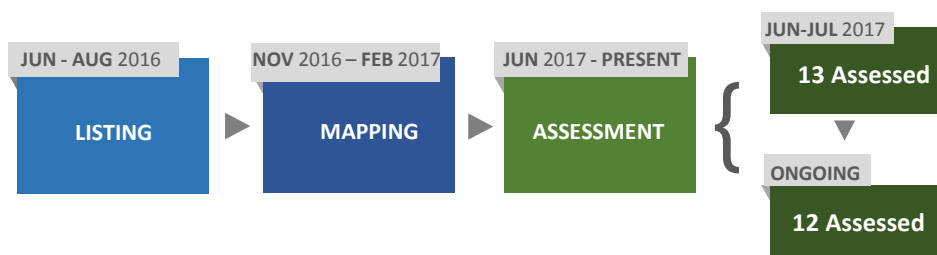
- Plantations and mines are often situated in remote areas near forests where malaria transmission is highest;
- MMP's exposure to infective bites is magnified by an underestimation of the risks of malaria, limited understanding or availability of effective and appropriate malaria prevention measures – particularly due to working hours that can expose them during peak biting times;
- When MMPs fall ill, appropriate and easily accessible malaria diagnosis and treatment are often difficult to reach due to long travel distances and associated cost barriers or other social and cultural barriers;
- Due to their transitory lifestyle, exacerbated by high levels of poverty, MMPs typically make limited contact with the public health services **either because of the structure of the public health system that only allots access in their home province or they lack health insurance all together** and often access private providers where appropriate care may not be consistently dispensed.

# WORKSITE STUDY OVERVIEW

Given the absence of information on worksites, including their location and existing health services onsite, as well as the need to design a study approach appropriate to Vietnam, PSI adapted the approach used by PSI in Cambodia and Myanmar, which resulted in a three-step process.

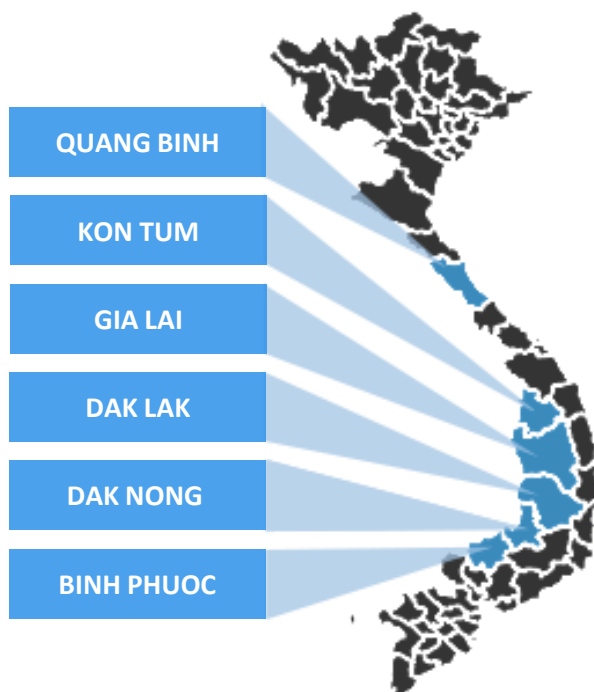
LISTING	MAPPING	ASSESSMENT
12,633 worksites of all types and sizes identified through a full census activity conducted in 28 districts of 6 provinces.	158 worksites mapped & assessed in 22 districts of 5 provinces, only 4 types and sites with >50 workers in peak season included.	25 prioritized worksites in 13 districts of 5 provinces assessed for need and feasibility of onsite services and/or Behavior Change Communication (BCC).

## TIMELINE



## STUDY GEOGRAPHY

Worksite listing was conducted in 6 provinces: **Binh Phuoc, Gia Lai, Dak Lak, Dak Nong, Kon Tum** and **Quang Binh**, although Dak Nong was removed from Mapping and Assessment phases of the research consistent with the five provinces included in the GEMS Program. Although the malaria caseload is declining across Vietnam, continued work in these central provinces will be essential to elimination, particularly along the border. As continued work within each province requires coordination and approval at the provincial level, PSI has built relationships with each provincial government and has adapted its strategy accordingly. PSI piloted each of the three parts of the worksite research in Binh Phuoc province due to strong support from the provincial government and the province's high malaria burden context.





# WORKSITE LISTING

## QUICK SUMMARY

The first part of the worksite research involved a full census activity to identify all worksites in PSI's six target provinces. The pilot was launched in Binh Phuoc province and the methodology was adjusted using lessons from the pilot prior to listing in the other provinces. Overall, 12,633 worksites of all types and sizes were found through the entire listing exercise, which was significantly higher than the number recorded in public data sources. Among all worksites listed, 45% were fully government-owned whereas 37% were commercially-owned and the remainder were family-owned.

## OVERVIEW

The first part of the worksite research involved a full census activity to identify all worksites. After evaluating the challenges and costs of outsourcing this work to an external research agency, PSI decided to conduct this research in partnership with provincial government partners who were able to secure support from district and commune officials as well as local Health Volunteers.

## OBJECTIVES

1

### Identify All Worksites

The listing exercise was conducted through physical visits by survey teams and focused on identifying all worksites in the provinces, regardless of size or type.

2

### Compare Listings

The list of actual worksites identified was then compared to the official listing records of registered worksites.

## BINH PHUOC PILOT

Binh Phuoc province was used to pilot the listing methodology in June 2016 and using the lessons learned from this pilot, the approach was refined and rolled out in the remaining five provinces. Working closely with the provincial Department of Health (DOH) staff, a list of the estimated number of worksites was generated. Teams of local enumerators (Village Health Workers or Malaria Volunteers) were then trained and supervised by PSI to use snowball sampling to identify and visit every agricultural, mining, logging, hydroelectric dam worksite in the

vicinity, and compile a full census list of eligible worksites. Eligibility depended on worksites reported having 50 or more workers during the busiest month of the prior 12 months (50 was the number of workers believed to be the minimum population for which a cost-effective malaria-based intervention could be deployed—as **determined by PSI**). Each eligible worksite was asked to provide information about the worksite’s business, ownership status and workforce.

Binh Phuoc was selected for the pilot for the following reasons:

1

Binh Phuoc is the only province that reported an increase in confirmed cases in 2015 and has the second highest burden nationally.

2

Support from Binh Phuoc Department of Health for malaria elimination research and programming.

3

PSI’s experience conducting previous studies in the same districts including a qualitative study among forest goers conducted in collaboration with UCSF.

## LISTING REMAINING PROVINCES

### ADAPTED METHODOLOGY

Using the lessons learned from the pilot, PSI adapted the listing methodology to be used in the remaining provinces.

#### Worksite Criteria

>10 workers

Worksites of all size were listed. However, data was only recorded for worksites with more than 10 workers during the busiest month.

#### Worksite Type

Government-owned, commercially-owned and family-owned worksites were listed, regardless of legal registration status. The following types of worksites were listed:

1	agricultural plantations / farms
2	mining companies
3	logging companies
4	hydroelectric dams

#### Local Enumerators

Following the pilot, local enumerators, usually commune health workers, were recruited through the public health system in each province. The benefits of using this cadre of enumerators included their knowledge of local geography and communities, which facilitated listing data collection. In total, 322 enumerators were trained and supervised to complete a full worksite listing in six provinces.

## Data Verification & Quality

PSI supervisors reviewed enumerator reports and randomly selected 50% of listed worksites for validation using physical visits. If an interview with the manager was not possible, a phone call appointment was made. Additional data validation steps included:

- GPS coordinate points collected for verified sites.
- PSI staff supervising and coaching enumerators during data collection.
- Daily check-ins with all enumerators by telephone.

## LISTING RESULTS

### Total Worksites

In total, 12,633 worksites were listed in 28 districts of six high malaria burden provinces. This is a significantly higher number than the 893 sites identified using available public data sources prior to the physical listing. Of the 12,633 sites identified, the majority, 8,082 worksites (64%), were small-scale (employing <10 workers during the busiest month in the past year). Medium worksites (between 10-49 workers during the busiest month in the past year) were the second largest group with 4,255 worksites of this type listed (34%). Large worksites were the smallest category with 296 worksites (2%)—who reported employing >50 workers during the busiest month in the past 12 months—listed.

### Business Type

Of the 296 larger sites, 44% were rubber plantations, 14% were cashew plantations and 8% were coffee plantations. Worksite business type varied significantly by province. In Kon Tum, 40 out of 53 of the larger worksites were rubber plantations, in Gia Lai only 1 of the 38 larger worksites was a rubber plantation.

## Financial Incentive System

The financial incentive system during the pilot paid a flat allowance for training and data collection. Following the pilot, PSI modified the allowance to be results-based and to account for greater travel distance and time.

REPORTING	TRAINING	ACTIVITY	VND	USD
		Base Transport	150,000	6.60
		Additional Travel >50km	100,000	4.40
		Data Submission	250,000	10.00
		Payment Per Med Worksite	10,000	0.50
		Payment Per Large Worksite	30,000	1.50

### Worksite Ownership

Out of all worksites with >50 workers listed, 45% were government-owned, 37% were commercially-owned and 18% reported as being family-owned or not registered. The proportion of worksites which were government-owned (partially or fully) also varied by province. In Gia Lai, none of the larger worksites were government-owned; however, in Kon Tum and Quang Binh, approximately 8 out of 10 of the larger worksites were reported to be government-owned. In Binh Phuoc, a majority of the worksites were privately owned (61%), and in Gia Lai, most worksites were family-owned or non-registered worksites (71%).

### Onsite Healthcare

Approximately 25% of all the larger worksites reported having some form of onsite healthcare. This ranged from 3% of the sites in Gia Lai to 47% in Kon Tum. The enumerators did not physically verify or assess the quality or extent of these health services, which was to be further assessed through the worksite mapping study.

## LISTING DATA COLLECTION

Province	District (# communes)	Confirmed malaria cases 2015	# Worksites identified using public records	# Worksites identified during listing study	# Worksites with <10 workers	# Worksites with 10-49 workers	# Worksites with >50 workers	Total # Worksites with >50 workers
Binh Phuoc	Bu Dang (16)	227	169	471	429	28	14	90
	Bu Dop (7)	219	39	213	195	10	8	
	Bu Gia Map (8)	952	233	234	206	18	10	
	Loc Ninh (16)	145	109	138	92	29	17	
	Phu Rieng (10)	19	N/A	815	772	26	17	
	Phuoc Long (7)	130	16	293	232	37	24	
<b>Total</b>		<b>1692</b>	<b>566</b>	<b>2164</b>	<b>1926</b>	<b>148</b>	<b>90</b>	
Dak Nong	Cu Jut (8)	152	38	213	207	5	1	29
	Dak Mil (10)	33	58	1049	466	575	8	
	Dak Song (9)	34	60	1175	927	244	4	
	Tuy Duc (6)	118	77	100	45	39	16	
<b>Total</b>		<b>337</b>	<b>233</b>	<b>2537</b>	<b>1645</b>	<b>863</b>	<b>29</b>	
Dak Lak	Ea H'leo (12)	174	3	120	85	25	10	64
	Ea Súp (10)	128	4	73	47	18	8	
	Buôn Đôn (7)	124	3	414	170	240	4	
	Cư M'gar (17)	112	2	340	254	73	13	
	Krông Năng (12)	50	1	1492	1243	241	8	
	Ea Kar (16)	50	2	899	343	535	21	
<b>Total</b>		<b>638</b>	<b>15</b>	<b>3,338</b>	<b>2142</b>	<b>1,132</b>	<b>64</b>	
Quang Binh	Minh Hoa (16)	132	1	160	106	53	1	18
	Tuyen Hoa (20)	114	1	500	115	381	4	
	Bo Trach (30)	55	3	310	283	14	13	
<b>Total</b>		<b>301</b>	<b>5</b>	<b>970</b>	<b>504</b>	<b>448</b>	<b>18</b>	
Kon Tum	Ngoc Hoi (8)	55	10	80	64	5	11	55
	Dak To (9)	31	7	220	14	198	8	
	Dak Ha (9)	20	11	90	75	8	7	
	Sa Thay (11)	21	18	600	36	559	5	
	la H'Drai (3)	22	N/A	100	69	7	24	
<b>Total</b>		<b>149</b>	<b>46</b>	<b>1090</b>	<b>258</b>	<b>777</b>	<b>55</b>	
Gia Lai	Ayun Pa (8)	76	2	217	24	182	11	40
	KôngChro (14)	178	9	650	495	130	25	
	la Pa (9)	252	6	622	227	392	3	
	Krông Pa (14)	1145	11	610	426	183	1	
<b>Total</b>		<b>1,651</b>	<b>28</b>	<b>2099</b>	<b>1,172</b>	<b>887</b>	<b>40</b>	
<b>TOTAL</b>	<b>28 districts (322 communes)</b>	<b>4,768</b>	<b>893</b>	<b>12,198</b>	<b>7,647</b>	<b>4,255</b>	<b>296</b>	<b>296</b>



## WORKSITE MAPPING

### QUICK SUMMARY

The second part of the worksite research involved a mapping assessment of worksites selected from the total number of larger worksites listed. PSI procured and trained an external research agency to collect mapping data from selected worksites including worksite profiles, GPS readings, worker demographics and onsite malaria test and treat services. In total, 158 sites were mapped within five provinces: Binh Phuoc, Gia Lai, Dak Lak, Kon Tum and Quang Binh.

### OVERVIEW

The worksite mapping exercise identified a sub-set of worksites that underwent a full assessment of the conditions onsite including the availability of malaria test and treat services. This subset of the initial 12,633 worksites included only large worksites in order to identify sites that may be suitable locations to provide onsite malaria services and/or information to workers at risk. “Large” worksites were defined as worksites with 50 or more workers during the busiest month of the past year.

# OBJECTIVES

1

## GPS Readings

Teams involved in collecting worksite mapping data were equipped and trained to collect a GPS reading at the main office, or entrance of each of the 246 sites visited during the mapping exercise.

2

## Worksite Profiles

Data on worksite characteristics was collected, including:

- Business characteristics
- Number of workers on site and seasonal changes
- The type of worker employed (permanent, seasonal and daily)
- A typical working day, including night hours
- Access to onsite or nearby healthcare
- The perceived impact of malaria on business.

3

## Worker Demographics

Data was collected to better understand the socio-economic status of workers, their mobility, and whether they travel with their families. Topics included:

- Socio-economic status of the workers
- Travel histories, worker mobility, and province of origin
- Family members travelling or living/working onsite

4

## Healthcare Availability

Data on the onsite availability of health services and health perception—among worksite managers—was collected, including:

- Availability and use of health services onsite and close to the site
- Top three ranked health concerns
- Malaria perception, knowledge and practices.

# HIGH RISK WORKSITES

Of the 246 worksites eligible to be considered for inclusion in the mapping, 181 were included based on their higher assessed malaria risk due to the nature of their activities and of these 158 were mapped and interviewed. Sites with workers exposed to forest were prioritized for inclusion in the mapping study.

Risk Category	# Listed	# Sampled	Risk Definition
High Risk	23	23	High risk sites include (a) <b>any forest related business (individual or small groups that spend time working under the forest canopy)</b> (b) <b>all hydroelectric dam sites</b> have been considered high risk.
Medium Risk	128	128	Medium risk sites include (a) <b>all rubber sites</b> due to potential vector-friendly conditions— <b>larger plantations</b> and <b>working hours (daytime hours)</b> (b) <b>cashew, sugar and cassava plantations</b> with higher number of workers defined as those with >100 workers. These sites were predicted to be low transmission sites as cashew, sugar and cassava trees grow close to the ground and are therefore less conducive to vector breeding. However sites that attract higher numbers of workers are ideal sites for potentially establishing malaria services.
Low Risk	95	30	Low risk sites include (a) <b>all processing sites</b> which were assumed to be housed in walled buildings (offering some protection from infection) (b) miscellaneous sites including <b>pig, vegetable and fruit farms, coffee and tobacco plantations, and stone mines.</b>

## METHODOLOGY & DATA COLLECTION

### Owner Sample Size and Sampling

The owner or onsite manager at each of the mapped worksites were interviewed, following informed consent. Refusal rates were low, although multiple visits were sometimes necessary to find and speak with the appropriate person.

### Team Set-up and Training

15 data collectors and 5 field supervisors were hired from the Acorn research agency. 5 PSI supervisors accompanied research teams. All data collectors (PSI and agency staff) underwent a two-day training organized by PSI, prior to the mapping pilot. Sessions covered (i) the purpose of the study; (ii) how to administer the questionnaire; (iii) how to correctly obtain consent; (iv) field and quality check protocols; (v) correct use of the form/electronic data entry; (vi) how to take accurate GPS readings at each site; and (vii) the importance of professionalism at all times to build trust at each site.

### Data Collection and Follow-up

The mapping study used a questionnaire to collect data from worksite owners/managers, and the data was entered into tablets (see overview below). If the worksite owner or manager was unavailable at the time of the first scheduled visit, the survey team made two return visits on subsequent days.

### Fieldwork Process

A PSI staff member was responsible for meeting the site owner, facilitating the consent process and addressing any questions from the owner/manager. Participating sites were contacted by phone or approached in person by the PSI researchers. The aim of the study was explained without reference to malaria and preliminary verbal consent was sought. Data quality was checked through verification by the PSI supervision team—through both on-the-spot supervision and post-data collection follow-up checks.

### Manager Questionnaire Overview

Introduction	Talking points and informed consent
Section 1	Enterprise information: location; GPS coordinates; review of contact information
Section 2	Business characteristics: type; private/government, formal/informal worksites; scale
Section 3	Worker profile: origins; daily, seasonal or permanent workers, accompanied by family
Section 4	Typical working day: working hours; outdoor activities; accommodation
Section 5	Business operations: worker payment mechanisms
Section 6	Perceived worker health and access to healthcare
Section 7	Worksite malaria prevention activities and respondent perceptions of malaria
Section 8	Previous/ongoing social/health engagement with public or non-profit partners

## BINH PHUOC PILOT & METHODOLOGY ADJUSTMENTS

The pilot mapping study was carried out in June 2016 in Phu Rieng and Dong Phu districts of Binh Phuoc. Aspects of the mapping study that were assessed during the pilot included i) the time required to complete a visit to one worksite; ii) the effectiveness of the rapport-building talking points/questions; iii) the logic and flow of the questionnaire; iv) the team management and organization; v) the feasibility of the proposed worker sampling approaches; and vi) any unanticipated challenges, including issues with question comprehension and interpretation.

## SUMMARY OF LARGER SITES PRE-MAPPING

	Binh Phuoc		Dak Nong		Dak Lak		Quang Binh		Kon Tum		Gia Lai		(n=296)	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Ownership														
Government	27	30%	15	52%	30	47%	17	77%	43	81%	0	0%	132	45%
Private company	55	61%	11	38%	19	30%	5	23%	10	19%	11	29%	111	38%
Family-owned or managed and non-registered worksites	8	9%	3	10%	15	23%	0	0%	0	0%	27	71%	53	18%
<b>TOTAL</b>	<b>90</b>	<b>100%</b>	<b>29</b>	<b>100%</b>	<b>64</b>	<b>100%</b>	<b>22</b>	<b>100%</b>	<b>53</b>	<b>100%</b>	<b>38</b>	<b>100%</b>	<b>296</b>	<b>100%</b>
Business Type														
Extractive businesses														
Hydroelectric Dams	2	2%	0	0%	2	3%	1	5%	2	4%	1	3%	8	3%
Mines	0	0%	1	3%	0	0%	3	14%	0	0%	1	3%	5	2%
Logging company	0	0%	2	7%	0	0%	0	0%	2	4%	0	0%	4	1%
Agricultural businesses														
Rubber plantation	39	43%	12	41%	24	38%	13	59%	40	75%	1	3%	129	44%
Cashew plantation	42	47%	0	0%	0	0%	0	0%	0	0%	0	0%	42	14%
Sugar cane plantation	0	0%	0	0%	16	25%	0	0%	0	0%	17	45%	33	11%
Other types of farms	7	8%	3	10%	5	8%	4	18%	0	0%	11	29%	30	10%
Coffee plantation	0	0%	7	24%	13	20%	0	0%	4	8%	0	0%	24	8%
Forest conservation and ecosystem rehabilitation	0	0%	4	14%	3	5%	1	5%	3	6%	0	0%	11	4%
Chili plantation	0	0%	0	0%	0	0%	0	0%	0	0%	6	16%	6	2%
Cassava plantation	0	0%	0	0%	1	2%	0	0%	2	4%	1	3%	4	1%
<b>TOTAL</b>	<b>90</b>	<b>100%</b>	<b>29</b>	<b>100%</b>	<b>64</b>	<b>100%</b>	<b>22</b>	<b>100%</b>	<b>53</b>	<b>100%</b>	<b>38</b>	<b>100%</b>	<b>296</b>	<b>100%</b>
Healthcare Services Onsite														
<b>TOTAL</b>	<b>25</b>	<b>28%</b>	<b>5</b>	<b>17%</b>	<b>15</b>	<b>23%</b>	<b>2</b>	<b>9%</b>	<b>25</b>	<b>47%</b>	<b>1</b>	<b>3%</b>	<b>73</b>	<b>25%</b>

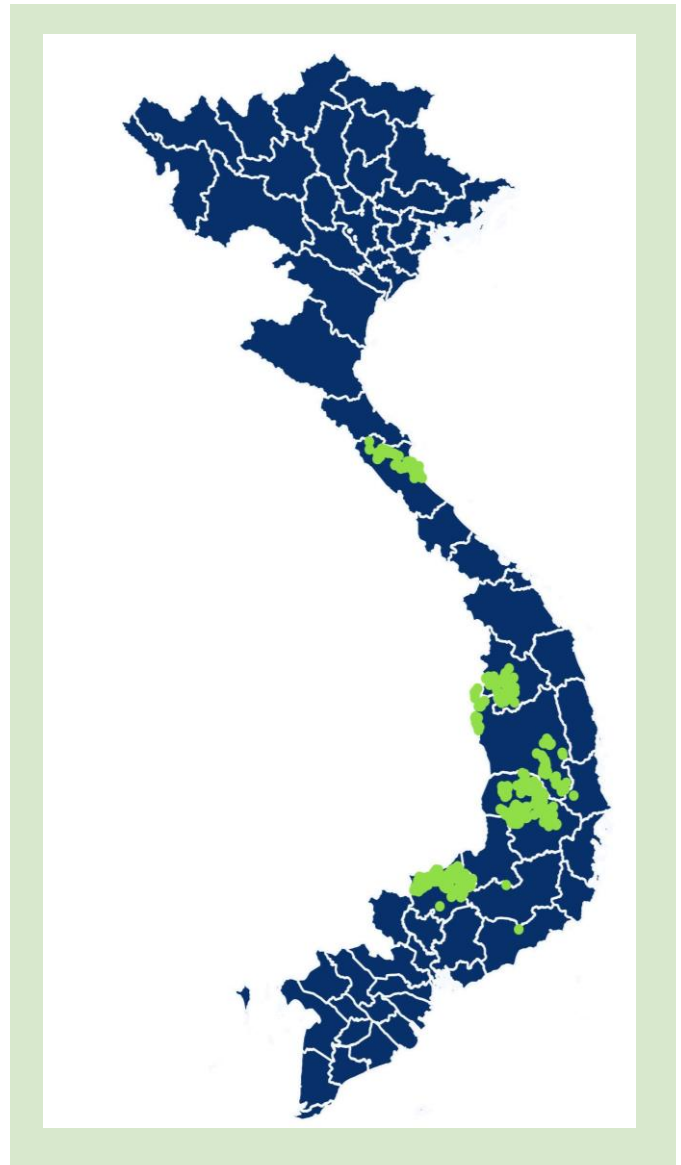
## MAPPING RESULTS

205 out of 246 sites on the sampling list were approached, and of these 158 were mapped and interviewed. **41 worksites were not approached due to their lower assessed risk** and 47 worksites were approached but not interviewed because i) the worksite was found closed or relocated; ii) the worksite owner/manager refused to participate; or iii) the worksite was identified as a satellite location of another worksite already included in the sample.

### Key Insights

- Rubber plantations were 42% of all worksites mapped.
- 63% of worksites from Quang Binh (n=8) and 56% of worksites from Binh Phuoc (n=43) reported hiring workers who are from outside the province. In other cases, most workers come from within the same province.
- 49% of worksites reported providing permanent workers with housing compared to the 16% who reported providing seasonal workers with housing.
- 32% of worksites reported having a case of malaria on the worksite in the past two years. 51% of worksites reporting malaria cases in the last 2 years were rubber plantations.
- 44% of worksites interviewed reported some onsite healthcare, but only 11% and 15% provide malaria diagnosis or treatment respectively. Government-owned worksites are more likely to have healthcare onsite. None of the worksites interviewed in Gia Lai or Quang Binh reported any onsite malaria services.
- 91% of worksites expressed initial interest in collaborating with PSI to receive malaria care for workers.

### Worksites Mapped by Province





## WORKSITE ASSESSMENT

### QUICK SUMMARY

The third and final part of the worksite strategy applied prioritization criteria to the worksites mapped in the previous exercise. PSI identified a subset of 26 worksites with the highest risk of malaria in order to develop comprehensive worksite profiles through manager interviews and to assess the potential for onsite malaria programming. Ultimately, 25 worksites were prioritized for further consideration, and of these, 13 worksites in three provinces were visited by PSI staff and DOH representatives, resulting in the identification of 4 worksites (2 in Dak Lak and 2 in Binh Phuoc) to receive onsite malaria services.

### OVERVIEW

The final part of the worksite research was informed by criteria based on data collected from the worksite mapping activity and known malaria risk factors. For further assessment, with a view to designing a program intervention, PSI prioritized worksites with the highest risk of malaria based on aggregated known risk factors at each worksite (see “Refining Score and Worksite Prioritization”) and identified program possibilities among the 144 of the 158 mapped worksites where managers expressed willingness to work with PSI. This resulted in the identification of 26 priority sites, after which PSI began worksite visits with Department of Health representatives to further assess site-specific opportunities to provide malaria test-treat-track services.

## OBJECTIVES

1

### Refine Scope

PSI developed criteria in order to further prioritize worksites with the highest risk depending on known risk factors including business type, forest proximity, malaria history, and overall anticipated worker risk and size.

2

### Assess Needs

PSI together with DOH representatives, visited locations where workers stay, work and rest to further assess the need for and feasibility of onsite malaria services and/or information.

## WORKSITE PRIORITIZATION

Criteria	Prioritization		
	High	Medium	Low
A. Business type	Forest preservation/ Hydroelectric dam (>49 workers)	(a) all rubber sites (>50 workers) were assumed to be medium to high risk (b) cashew, sugar and cassava plantations with higher number of workers defined as those with >100 workers.	a) all processing sites because they are assumed to be housed in walled buildings offering some protection from infected mosquitos (b) miscellaneous sites including pig, vegetable and fruit farms, coffee and cigarette plantations, stone mines and other sites (<50 workers).
B. Distance from forest (km)	0–2 km	3 km – 10 km	>10 km
C. Having malaria case in last 2 years	This criteria was used as an additional data point to help determine risk level.		
Classification	Prioritization		
	High	Medium	Low
Classification	High + High - or - High + Med (including malaria case last 2 years)	High + Med (no malaria case last 2 years) - or - Med + Med - or - High + Low (including malaria case last 2 years)	High + Low (no malaria case last 2 years)

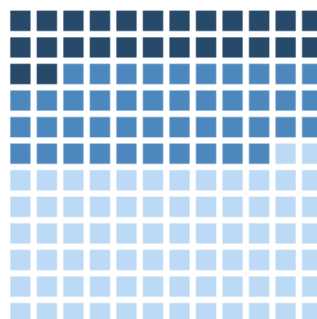
## Worksite Prioritization Results

In order to further prioritize worksites from the mapping exercise, PSI developed a prioritization and classification scheme to identify the highest risk worksites for which to plan programming. **Based on the combination of known risk factors** pertaining to business type and forest proximity, 26 worksites with the highest risk were identified.

**26 High Priority**

**44 Medium Priority**

**74 Low Priority**



## Prioritized Worksites: Business Type & Ownership

Business Type	Binh Phuoc	Dak Lak	Gia Lai	Kon Tum	Quang Binh	Total
Rubber	3	5	0	7	1	16
Forest preservation sites	1	3	0	2	0	6
Hydroelectricity	0	0	1	1	0	2
Sugar cane	0	0	1	0	0	1
Others	0	0	0	1	0	1
<b>Total</b>	<b>4</b>	<b>8</b>	<b>2</b>	<b>11</b>	<b>1</b>	<b>26</b>
Ownership	Binh Phuoc	Dak Lak	Gia Lai	Kon Tum	Quang Binh	Total
Government-owned	3	5	0	9	1	18
Commercial	1	3	2	2	0	8
<b>Total</b>	<b>4</b>	<b>8</b>	<b>2</b>	<b>11</b>	<b>1</b>	<b>26</b>

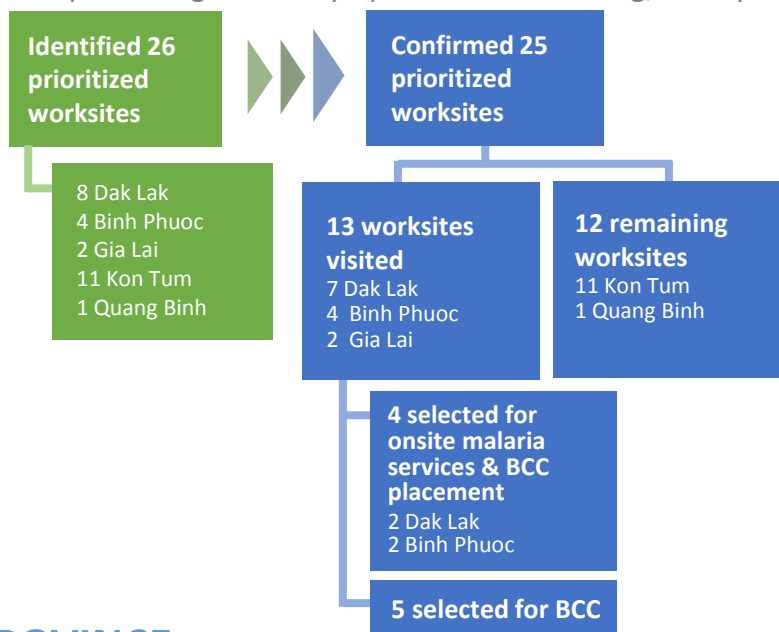
## Results and Analysis

Interestingly, provinces with the highest malaria caseload (Gia Lai and Binh Phuoc) were not the same as the provinces with the highest proportion of prioritized worksites found with at least one malaria case in the last two years. Only 30% and 13% of prioritized worksites in Binh Phuoc and Gia Lai respectively, were found with a malaria case in the last one year compared to 38% of worksites in Dak Lak, 36% in Kon Tum and 25% in Quang Binh. Of all worksite types, a higher percentage of hydroelectricity (50%) and rubber (44%) sites reported malaria cases in the last two years. More worksites reported having onsite malaria treatment compared to onsite malaria diagnosis services.

18 out of the 26 prioritized worksites (69%) were government-owned. 16 out of the prioritized 26 worksites (61%) were rubber plantations, followed by forest preservation (6 sites; 23%), and hydroelectricity (2 sites; 8%). Total worker volume at the 26 prioritized worksites during the busiest month was 9,106. None of the prioritized 26 worksites provide accommodation for seasonal workers.

# NEEDS ASSESSMENT AND WORKSITE PROFILES

Of the 26 prioritized worksites, one worksite had closed when revisited and thus PSI confirmed 25 prioritized worksites. As of late 2017, 13 of the 25 have been visited by PSI staff with DOH representatives, and the remaining worksites will be visited pending local approvals. Among the 13 assessed in 2017, 4 were selected to receive onsite malaria services and BCC; and another 5 were selected to receive 'Zero Malaria' BCC materials to encourage workers experiencing malaria symptoms to use existing/nearby malaria services.



## DAK LAK PROVINCE

### Hoang Anh Rubber Plantation in Ea Hleo District



**Overview:** At least 250 workers live onsite in poor conditions and work in the rubber plantation during potential biting times (dusk to dawn) for malaria mosquitos. The plantation operates seven days a week and workers start between 3-4 AM and end at noon. There were no signs of bed or hammock nets in use at the temporary worker housing units. Workers described not liking repellent, as it is difficult to use in hot conditions and can impair eyesight. No malaria cases were reported among workers in the past two years and no health services are offered onsite.

**Nearest Community Health Station (CHS):** The nearest CHS is 10 kilometers away and reported 320 cases tested during the first five months of 2017 and 1 positive case detected and treated.

## Yok Don National Park in Buon Don District



**Overview:** This site has an estimated 266 workers including 54 office-based workers and 212 employees who work, live, sleep in the forest. No children live on this site. The workers stay in the forest in small teams of 5-7 workers. They prepare hammock nets on their own. Some people also use repellent and coils. Hammock/bed nets were observed inside structures where workers stay. There are an estimated 22 small houses spread across the property, with large distances between them. Four malaria cases were found among workers at this site during the first half of 2017.

**Nearest CHS:** The nearest CHS is 10 kilometers, although some workers report visiting a private clinic 100 kilometers away due to this clinic's good reputation.

## BINH PHUOC PROVINCE

### Phu Thinh Rubber Plantation, Bu Gia Map District



**Overview:** Approximately 160 permanent workers and 200 temporary workers are employed at this site. The site operates 7 days per week during the harvest months, from May to January. Workers are onsite from 5-9 AM, break for two hours and resume from 11 AM to 4 PM. Workers live in their own houses outside the plantation. There are 9 different break structures used by teams of 25-35 workers.

The company provides coils and uniforms to help protect workers from mosquito bites and the sun. The 11 guards (who sleep inside the plantation) bring their own nets/hammock nets.

**Nearest CHS:** The nearest CHS is 10 kilometers away and detected multiple cases of both malaria and dengue in the first six months of 2017.

## Đak Mai Forest Preservation Company, Bu Gia Map District



**Overview:** There are 58 permanent workers, of which 44 stay inside the forest with 3-5 workers staying in 12 small structures. Sometimes the workers sleep in the forest and reportedly use coils, repellent, hammock/bed nets procured by workers. The 12 structures where workers stay are located 10 kilometers apart and the nearest small structure is 30 kilometers from the main office. The peak season is November-April. The manager of this site reported 5 cases of workers experiencing malaria in 2016.

**Closest CHS:** The nearest CHS is 15 kilometers away and reported multiple cases of malaria detected during the first six months of 2017.

## SUMMARY OF WORKSITES SELECTED TO RECEIVE ONSITE MALARIA SERVICES AND BCC

Province	Name of Worksite	Type of Worksite	Reported malaria cases in last 2 years?	Malaria cases detected by the nearest CHS?	Estimated number of workers at risk of malaria
Dak Lak	Hoang Anh Rubber Plantation	Commercial	No	Yes	250
Dak Lak	Yok Don National Park Forest Preservation Site	Government-owned	Yes	Yes	212
Binh Phuoc	Phu Thinh Rubber Plantation	Government - owned	Yes	Yes	350
Binh Phuoc	Đak Mai Forest Preservation Site	Government - owned	Yes	Yes	44

## MAP OF WORKSITES SELECTED TO RECEIVE ONSITE MALARIA SERVICES AND BCC

Of the 25 prioritized worksites, 4 were identified to receive onsite malaria services and BCC beginning in late 2017. The map to the right shows the locations of these sites in orange.



## CONCLUSION & NEXT STEPS

Research to assess malaria risk at worksites has been largely absent in Vietnam. PSI therefore developed a three-part research process to list, map and assess worksites in approved districts within provinces included in the GEMS Program. The goal of PSI's worksite research was to design program interventions to ensure workers have access to quality malaria testing and treatment services.

Through a listing exercise that identified 12,633 worksites, a detailed mapping exercise to collect data from a smaller number of high-risk worksites and finally a comprehensive prioritization of the highest risk worksites, PSI was able to identify 25 prioritized worksites with the highest malaria risk and the most feasible locations to implement targeted programming. As of the end of 2017, PSI and DOH partners have conducted joint visits to 13 of these 25 high priority worksites and initiated provision of onsite malaria services at 4 sites and placement of 'Zero Malaria' BCC materials at 9 sites. PSI is also planning to interview workers at prioritized sites to better understand worker perspectives regarding needs and preferences to inform future worksite malaria programming in Vietnam.

**12,633** worksites  
identified  
through the **LISTING**

**158** worksites  
prioritized  
through the **MAPPING**

**25** FINAL  
worksites  
selected  
through the **ASSESSMENT**

# ANNEX A: LESSONS LEARNED

## WORKSITE LISTING

### Delays Due to Obligations

The study timeline in several communes in Dak Lak, Dak Nong and Quang Binh was delayed because enumerators were unable to attend trainings although the local authorities had set the training dates based on enumerator availability. This affected the associated costs of PSI's travel and supervision and thus required changes to planned research timelines.

### Late Report Submissions

Although improvements were observed following changes made to the study design after the Binh Phuoc pilot, enumerators did not consistently submit reports on time. PSI supervisors were therefore required to remain in the districts until all reports were submitted, which affected research costs and timelines.

### Limited Enumerator Capacity

Approximately 2-4 enumerators per district had difficulty understanding the training material. PSI trainers accompanied these enumerators to provide additional training during data collection until enumerators were able to accurately complete the forms. Daily enumerator checkups by telephone were also part of the quality assurance measures used.

### Incentive-Driven Misreporting

Due to pilot financial incentives, some enumerators artificially inflated the number of reported workers per worksite. At Cu Klong commune in Dak Nong, a random PSI check found 15/100 worksites had <10 workers, while the enumerator reported >10 workers. The enumerator was denied all allowances until the listing was re-submitted. For this reason, PSI supervisors validated data extremely carefully for communes with larger worksites reported and revised the incentive scheme.

## WORKSITE MAPPING

### Insufficient Supervision / Staff

Whereas the research agency's contract commitment was to provide 5 supervisors and 15 data collectors, only 3 supervisors and 14 data collectors arrived in Binh Phuoc. Furthermore, a new data collection team was provided, instead of the same team previously trained by PSI during the pilot as requested. PSI addressed this issue by providing an extra half-day training and requesting the agency to arrange additional staff.

### Inflated Refusal Rate

The limited capacity of the external agency to convince worksites to participate in interviews initially inflated the refusal rate. Thus, PSI added a requirement that PSI's research team must approve the replacement of inaccessible sites with replacement sample sites. Initially, Acorn had the authority to select a back-up site when sites were difficult to engage. With increased involvement of PSI in approaching worksites, the refusal rate fell from 6 out of 44 sites in Binh Phuoc to only 2 refusals in the remaining 4 provinces.

### Worksite Verification

Not all worksite listing were verified during mapping. In some cases the mapping visits identified worksites where fewer workers were found onsite than previously recorded. In addition, some sites (recorded as one worksite) were actually non-adjacent satellite locations of already mapped sites operated by the same owner.

### Onsite Quality Control Required

Acorn initially relied on office-based review of audio-recorded interviews without providing on-site quality control support in the field. Following this finding, PSI and Acorn re-checked data and PSI required the agency to deploy three quality control team members to the field for onsite monitoring.

# ANNEX B: SOURCES

- <sup>1</sup>WHO (2013) *Emergency response to artemisinin resistance in the Greater Mekong Sub-region: regional framework for action 2013-2015*. Geneva: World Health Organization.
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- <sup>4</sup>MIS data 2015, National Data from NIMPE and NMCP, Mar 2016.
- <sup>5</sup>Erhart A, Ngo DT, Phan VK, .et al. (2005). Epidemiology of forest malaria in central Vietnam: a large scale cross sectional survey. *Malaria Journal*, 4(58).
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- <sup>7</sup>National Institute of Malariology, Parasitology, and Entomology (NIMPE). (July 2017) . Case Management and Confirmed Diagnosis. *Malaria Surveillance in Vietnam: Meeting for Strengthening Surveillance of Malaria Control and Elimination in the Western Pacific Region*.
- <sup>8</sup>Regional Steering Committee for the Regional Artemisinin Initiative (RAI). 2013. Regional Artemisinin Initiative Concept Note to Global Fund to Fight AIDS, Tuberculosis and Malaria.
- <sup>9</sup>Government of the Socialist Republic of Vietnam: Ministry of Health. (2014). Decision No 4717/QD-BYT
- <sup>10</sup>Regional Steering Committee for the Regional Artemisinin Initiative (RAI). 2013. Regional Artemisinin Initiative Concept Note to Global Fund to Fight AIDS, Tuberculosis and Malaria.
- <sup>11</sup>Nguyen, T., Berman, P., Larsen, U. (2002). Household utilization and expenditure on private and public health services in Vietnam. *Health Policy and Planning*, 17(1):61.
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