U.S. PRESIDENT'S MALARIA INITIATIVE

PMI | Africa IRS (AIRS) Project

Indoor Residual Spraying (IRS 2) Task Order Six

2016 PMI AIRS MADAGASCAR END OF SPRAY REPORT

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2016 PMI AIRS MADAGASCAR
END OF SPRAY REPORT

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ACRONYMS

AIRS	Africa Indoor Residual Spraying
BCC	Behavior Change Communication
BHC	Basic Health Center
CDC	Center for Disease Control and Prevention
CFV	Control Flow Valve
DCV	Data Collection Verification
DEC	Data Entry Clerk
DLP	Malaria Control Directorate (*Direction de Lutte contre le Paludisme*)
ECO	Environmental Compliance Officer
HLC	Human Landing Catch
IEC	Information, Education, and Communication
IRS	Indoor Residual Spraying
LLIN	Long-Lasting Insecticide-treated Net
M&E	Monitoring and Evaluation
MoE	Ministry of Environment
MEP	Monitoring and Evaluation Plan
MSP	Mobile Soak Pit
NMCP	National Malaria Control Program
PCV	Peace Corps Volunteers
PMI	U.S. President's Malaria Initiative
PPE	Personal Protective Equipment
PSC	Pyrethrum Spray Catch
SBCC	Social Behavior Change Communication
SEA	Supplemental Environmental Assessment
SM/TL	Sector Manager/Team Leader
SOP	Spray Operator
TO	Task Order
TOT	Training of Trainers
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

EXECUTIVE SUMMARY

The objective of the PMI AIRS Project is to limit exposure to malaria vectors and reduce the incidence and prevalence of malaria through indoor residual spraying (IRS). To achieve this objective, AIRS Madagascar conducted IRS campaigns in two regions with long lasting organophosphates (Actellic CS 300), the East Coast and the South East. The first campaign began in the South East, where 119,959 structures were sprayed in two districts (Farafangana and Vohipeno) from July 25 to August 22, 2016. . The IRS campaign in the East Coast was conducted in three districts (Brickaville, Tamatave II and Fénérive Est) from September 5 to October 1, 2016, spraying 190,467 structures. In total, AIRS Madagascar found 329,395 structures and sprayed 310,426 structures, resulting in an overall 94.2% coverage rate for all five districts while protecting 1,257,036 people from the burden of malaria in 2016.

The following are key highlights of AIRS Madagascar's spray campaigns in 2016:

- A total of 190,467 structures were sprayed in the East Coast (50,046 in Brickaville, 79,129 in Fenerive Est and 61,292 in Tamatave II) and 119,959 structures in the South East (80,236 in Farafangana and 39,723 in Vohipeno). The spray coverage was 95.9% in the East Coast and 91.8% in the South East. A total of 310,426 structures were sprayed of the 329,395 structures found by spray operators (SOPs), resulting in an overall spray coverage rate of 94.2%.
- AIRS Madagascar trained 4,232 people (2,096 people in the East Coast and 2,136 in the South East), 1,441 (34.1%) of whom were women, to implement the 2016 IRS campaign.
- AIRS Madagascar used 53,212 bottles of Actellic® CS 300 with utilization ratios of 5.2 structures per bottle in the East Coast and 7.1 structures per bottle in the South East.
- During the first week of the IRS campaigns in the East Coast and the South East, AIRS Madagascar conducted cone bioassay tests to assess the quality of spraying. The results indicated 100% mortality for all of the structures sampled.
- AIRS Madagascar utilized mobile soak pits (MSPs) in remote areas to reduce the travel time of spray operators and safely dispose of IRS liquid waste from the field. The use of Tyvek suites to replace cotton coveralls was piloted in two communes in the South East and in three communes of East Coast.
- AIRS Madagascar implemented two mobile technologies, a mobile performance management tracking (PMT) tool to monitor daily operational results, and an e- Inventory system to monitor the current stock of insecticide and spray equipment at all operational sites.
- Both campaigns in the South East and the East Coast experienced early challenges with spray coverage, although for different reasons. IEC messaging was strenghened during the campaign in collaboration with Peace Corps Volunteers (PCV) and the USAID partner project Mikolo .
- AIRS Madagascar organized advocacy meetings in all five districts with traditional leaders (*Ampanjaka* and *Tangalamena*) and local authorities prior to the spray campaign to minimize refusal rates.

Table 1 below shows the main results obtained during the IRS 2016 campaign.

TABLE 1: SUMMARY OF 2016 IRS CAMPAIGN RESULTS

Result	South East	East Coast	Total
Number of districts covered by PMI-supported IRS	2	3	5
Insecticide class	Organophosphates	Organophosphates	Organophosphates
Number of structures treated with PMI-supported IRS	119,959	190,467	310,426
Number of structures targeted by IRS, with the support of PMI	130,706	198,689	329,395
Spray coverage	91.8%	95.9%	94.2%
Population protected by the PMI-supported IRS	552,764	704,272	1,257,036
Pregnant women protected by the PMI-supported IRS	21,280	26,228	47,508
Children under five protected by the PMI-supported IRS	100,482	84,445	184,927
Number of people receiving training funded by the US Government (USG) to conduct IRS	652	920	1,572

1. INTRODUCTION

1.1 BACKGROUND OF IRS IN MADAGASCAR

PMI has been supporting IRS in Madagascar since 2008, in line with the National Malaria Control Strategy (2008-2012 and 2013-2017). IRS was initially implemented in 55 districts within the Central Highlands (CHL). Until 2011, all IRS in Madagascar was categorized as blanket spraying, providing IRS to as close to 100% of the eligible structures in targeted districts as possible. This IRS strategy has been successful through collaboration between PMI and The Global Fund, with both donors providing strong support towards IRS spray programs throughout Madagascar.

After the completion of four rounds of blanket spraying in the CHL, IRS shifted to focal spraying in communes that were deemed to have the highest rates of malaria incidence (i.e., according to HMIS data). Entomological surveillance continues in the areas where IRS was discontinued to monitor malaria transmission and vector density. In accordance with the National Strategic Plan, epidemiological trends and available resources, PMI and the National Malaria Control Program (NMCP) agreed to implement blanket IRS in three districts in the East Coast (Brickaville, Fenerive Est and Tamatave II) and two districts in the South East (Farafangana and Vohipeno) during the 2016 IRS campaign.

In 2016, AIRS Madagascar conducted spray operations in the South East from July 25 to August 22 and from September 5 to October 1 in the East Coast.

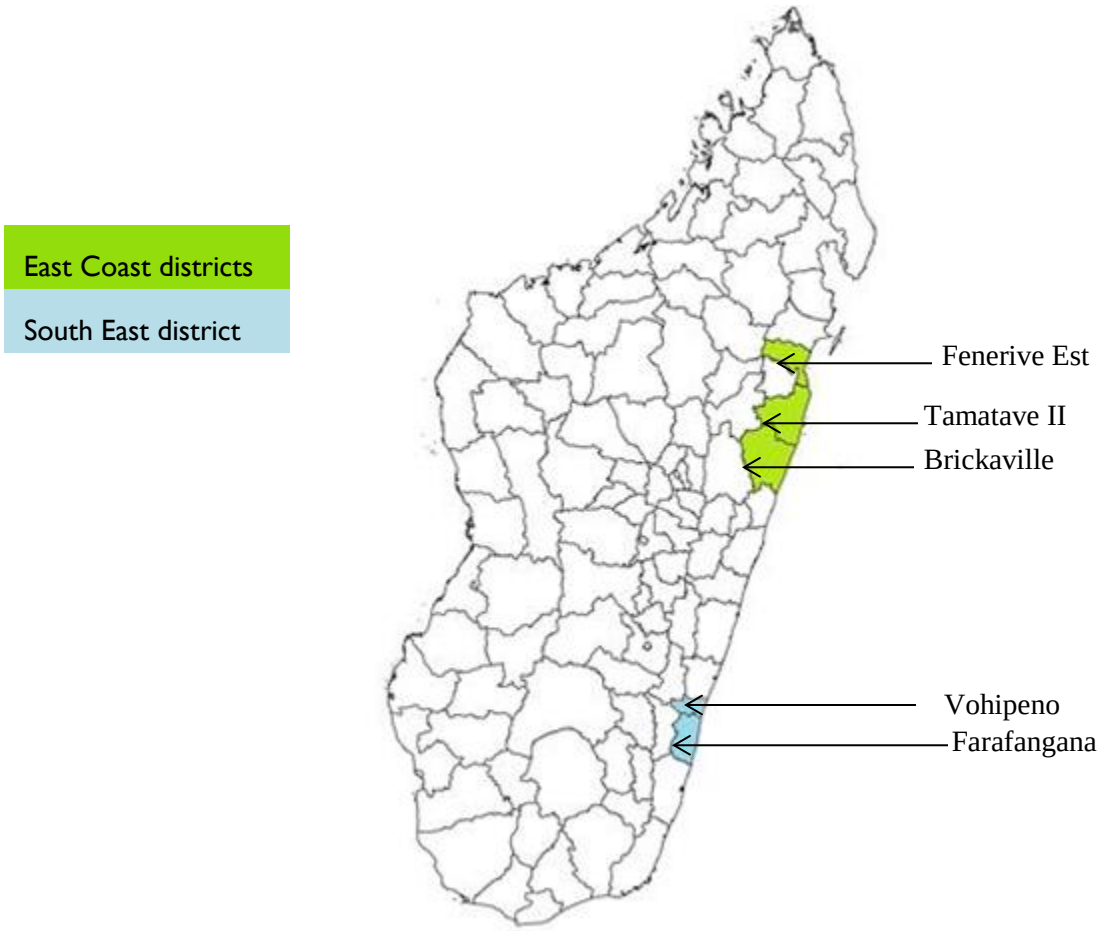
1.2 2016 CAMPAIGN OBJECTIVES

AIRS Madagascar's four main objectives for the 2016 IRS campaign were as follows:

1. Strengthen the capacity of seasonal spray campaign supervisors and government officials in monitoring and supervision of IRS activities;
2. Strengthen NMCP/DLP capacity in entomologic and environmental compliance monitoring;
3. Ensure high quality spraying is carried out on time, before the peak transmission season; and
4. Collect and analyze epidemiological data in the South East and the East Coast, in partnership with the NMCP/DLP.
5. Conduct IRS-related entomological monitoring and surveillance in seven sentinel sites for all the indicators: three in the East, two in the South East, one control site in the East, one control site in the South East. Four sites for susceptibility surveillance in four areas of CHL will continue.

The following map shows the areas that were sprayed during the 2016 campaign.

FIGURE 1: LOCATION OF SPRAY AREAS COVERED DURING THE 2016 IRS CAMPAIGN



2. PRE-SPRAY ACTIVITIES

2.1 IRS CAMPAIGN PLANNING

Listed below are the activities undertaken to plan and organize the 2016 IRS campaign.

2.1.1 DISTRICT AND INSECTICIDE SELECTION

In addition to selecting the insecticide to be used in each district, NMCP, PMI and AIRS Madagascar worked together to select the communes and districts to be sprayed in 2016. After reviewing entomological surveillance data following the 2014-2015 IRS campaign, organophosphates were selected to be the insecticide class used for the 2016 IRS campaign both in the South East and East Coast.

2.1.2 GEOGRAPHICAL RECONNAISSANCE IN VOHIPENO

AIRS Madagascar conducted geographical reconnaissance in all the five districts in 2016 to collect information for better quantification and spray planning. Detailed enumeration was conducted in Vohipeno district only, the new spray area in 2016, to collect informed estimates for the number of structures to be targeted as well as to gain a better understanding of cultural realities in this district.

The results provided AIRS Madagascar with an idea of the zone's accessibility and size and the nature of structures. This activity helped to establish the final list of intervention communes and to ensure environmental compliance in all activities.

For proper planning of the campaign, AIRS Madagascar conducted a survey of eligible structures to spray in the new spray district in South East. This activity helped to gather information on the types of materials used to construct the structures and the accessibility of each locality.

TABLE 2: LIST OF COMMUNES AND DISTRICTS TARGETED

Region	District	Number of Communes/Total	Class of Insecticide
ATSINANANA (EAST COAST)	BRICKAVILLE	10/18	ORGANOPHOSPHATE
ANALANJIROFO (EAST COAST)	FENERIVE EST	14/14	ORGANOPHOSPHATE
ATSINANANA (EAST COAST)	TAMATAVE II	12/19	ORGANOPHOSPHATE
TOTAL EAST COAST		**36/51**	
SOUTH EAST (ATSIMO ATSINANANA REGION)	FARAFANGANA	33/33	ORGANOPHOSPHATE
SOUTH EAST (VATOVAVY FITO VINANY REGION	VOHIPENO	21/21	ORGANOPHOSPHATE
TOTAL SOUTH EAST		**54/54**	
GRAND TOTAL		**90/105**	

2.1.3 MICRO-PLANNING

AIRS Madagascar held several internal meetings to plan and organize IRS campaigns in the South East and East Coast. A weekly communication to PMI/Madagascar included the spray progress and spray coverage of the campaign. Renewed and increased collaboration with the Government of Madagascar led to a larger involvement of officials from the NMCP/DLP and decentralized services of the Ministry of Public Health. Members were heavily involved throughout the planning and implementation process by providing training and conducting supervision of operations. AIRS Madagascar successfully organized a regional advocacy workshop on November 24, 2015 in Tamatave to share the 2015 IRS campaign results and proceed with the 2016 IRS campaign. The workshop made it possible to validate the final list of spray locations, including those to remove due to lack of access.

2.2 LOGISTICS NEEDS AND PROCUREMENT

Prior to the spray campaign, AIRS Madagascar conducted a logistics assessment in the East Coast and South East. The logistics assessment helped to review the following;

- Available stock of materials, consumables and equipment;
- Transportation arrangements, including vehicle hiring for spray operations and supervision;
- Estimation of insecticides,Personal Protective Equipment (PPE) and spray equipment required to meet the needs of spraying;
- Mobilization and distribution of equipment, materials and supplies.

The results from the assessment were used for international and local procurements. Most of the PPE and spray pumps used during the last campaign remained in acceptable and usable condition and were available for use in all five districts. AIRS Madagascar recorded the quantities of damaged or non-reusable PPE, and developed a list of PPE needed for the spray campaign. New Goizper pumps were purchased to be used in the South East.

Overall, AIRS Madagascar made local and international procurements using an open tender process, collecting bids/quotes on commodities to be purchased. The team also established the number and type of vehicles required for each district's IRS operations based on the intervention approach and accessibility of the areas. AIRS Madagascar conducted a competitive bidding process to lease rental vehicles for IRS operations and selected local companies to supply the transportation.

2.2.1 INTERNATIONAL PROCUREMENT

Please refer to the table in the Annex B for more information on PPE items purchased, used and remaining in stock after the IRS campaign. The PMI AIRS Project procured 45,468 bottles of Actellic® 300CS to cover the needs for the campaign based on the information that was available during the time period in which orders needed to be placed. The entire insecticide stock was used in the 2016 IRS campaign.

2.2.2 WAREHOUSES

Two central warehouses were needed as the East Coast and South East are separated by around 1,000km. Also, AIRS Madagascar closed the central warehouse in Antananarivo in December 2015. The central warehouse in Tamatave was extended and a Mezzanine of 145m^2 was added in April 2016 in order to accommodate all equipment and commodities brought from the former warehouse of Antananarivo and needed for the East Coast zone. The central warehouse of the South East was also rearranged; racks in woods were built in this warehouse in April 2016 so that commodities could be well organized and well stored. The former warehouse manager of Antananarivo was sent to the central

warehouse of Tamatave and the former central warehouse manager of Tamatave assigned to work in the central warehouse of Farafangana. The two Warehouse Managers were assigned to provide support to the storekeepers training and the spray campaign logistics.

2.3 HUMAN RESOURCE REQUIREMENTS

2.3.1 RECRUITMENT OF PERMANENT STAFF

In 2016, AIRS Madagascar recruited two district coordinators for Vohipeno (i.e., the new IRS target district) and Fenerive Est as part of efforts to better organize and supervise the IRS campaign. The previous district coordinator of Fenerive Est was promoted to IEC Officer.

2.3.2 HIRING OF SEASONAL STAFF

In collaboration with local government authorities, AIRS Madagascar hired 4,134 seasonal workers (2,092 seasonal workers in the South East, including 1,400 men and 692 women, and 2,042 seasonal workers in the East Coast, including 1,377 men and 665 women) for the 2016 IRS campaigns.

Table 3 shows the distribution of seasonal workers hired for each position, broken down by gender and spray zone.

TABLE 3: NUMBER OF SEASONAL WORKERS HIRED, BY SEX

Position	South East		East Coast		Total
	Male	Female	Male	Female	
Enumerators	14	8	0	0	22
Enumerator supervisors	153	119	0	0	272
Central Logistics Assistant	1	0	0	0	1
Central Financial Assistants	0	3	0	0	3
District Financial Assistants	0	2	1	3	6
E-Inventory	1	0	0	0	1
Environmental Compliance Assistant	1	0	0	0	1
M&E Assistant	0	2	2	1	5
Operations Assistant	1	0	0	0	1
Data Entry Clerks (DECs)	5	16	8	15	44
Sector Manager	40	14	30	15	99
Warehouse Keepers	13	41	9	31	94

Guardians	74	0	46	2	122
Team Leaders	31	58	81	52	222
Spray Operators	360	83	549	120	1,112
e-Inventory data clerk	0	1	0	1	2
Moto courier	20	0	17	2	39
Washers	0	58	2	72	132
Mobilizers	597	287	499	351	1,734
Porters	89	0	133	0	222
Total	**1,400**	**692**	**1,377**	**665**	**4,134**
Percentage of women	**33.1%**		**32.6%**		**32.8%**
TOTAL	**2,092**		**2,042**		**4,134**

2.3.3 PAYMENT OF SEASONAL WORKERS

AIRS Madagascar paid all seasonal staff through the TELMA mobile banking system. All seasonal workers were provided with a coupon which they used to receive cash in the amount credited to their coupon. Several advantages to using the mobile banking system over cash payments include:

- Decreased risk of theft and fraudulent activities;
- Time savings (i.e., staff did not have to travel to distribute the money);
- Greater access of women to their wages particularly in male-dominated families; and
- Increased transparency; all payments are recorded and tracked electronically.

2.4 TRAINING OF SEASONAL STAFF

AIRS Madagascar organized and hosted 24 training sessions (13 in the South East and 11 in the East Coast) for its seasonal staff. The training sessions were designed to ensure that all seasonal workers were trained in their roles and had a solid understanding of how to implement all campaign activities. The training sessions also included occupational precautions and emergency measures (such as in case of poisoning with insecticide). All training sessions were conducted by AIRS Madagascar's staff in collaboration with NMCP/DLP and representatives from the Ministry of Health at the national, regional and district levels. The training sessions in the South East took place from July 6 - 23, 2016. In the East Coast, the training sessions were held from August 15 – September 3, 2016. AIRS Madagascar trained a total of 4,232 people (2,136 in the South East and 2,096 in the East). Table 4 below shows the number of people trained, disaggregated by spray zone and sex.

TABLE 4: NUMBER OF PEOPLE TRAINED, DISAGGREGATED BY SPRAY ZONE AND SEX

Training	South East		East Coast		Total
	Male	Female	Male	Female	
Training of Spray Operators	391	141	630	172	1,334

Training of Trainers	42	14	29	15	100
Training of DECs and M&E Assistants	5	18	10	16	49
Training of Warehouse Keepers	14	42	9	32	97
Training of IEC mobilizers	597	287	499	351	1,734
Training of Washers	0	58	2	72	132
Training of Transporters	89	0	133	0	222
Training of Security Officers	74	0	46	2	122
Training of health workers for poisoning case management	24	41	29	45	139
Training of Financial Assistants	0	5	1	3	9
Enumeration training	167	127	0	0	294
Total M/F	**1403**	**733**	**1388**	**708**	**4,232**
Percentage of women	**34.3%**		**33.8%**		**34.1%**
Total	**2,136**		**2,096**		**4,232**

NB : 9 Peace Corps Volunteers participated in the training on advocacy session in Vohipeno and Brickaville

It should be noted that in addition to the seasonal staff recruited, public health workers participated in the various trainings. This accounts for the difference between the total number of seasonal staff recruited and the total number of people trained.

The trainings covered the following key topics:

- Introduction to malaria control;
- IRS planning and logistics management;
- Spray techniques and processes;
- Environmental compliance and personal safety;
- Advocacy and social mobilization;
- IRS monitoring and evaluation;
- Supervision of IRS activities; and
- Gender awareness.

The following is a short description of the trainings which took place in 2016:

Training of trainers (July 11 - 16, 2016 in the South East; August 22 -27, 2016 in the East Coast): AIRS Madagascar staff trained seasonal workers in managerial positions (including Sector Managers and M&E Assistants) and trainers from the health system on the following topics: the importance of IRS campaigns in malaria control, spraying techniques, importance of environmental compliance during IRS campaigns, filling in data collection forms, collection of data through mHealth SMS, supervision of spray teams, IEC message communication and preparation of homes for spray. The NMCP led the 2015 training of trainers (TOT) and made an important contribution to the TOT.

SOP Training (July18-23, 2016 in the South East; August 29 – September 3, 2016 in the East Coast): SOPs were trained on the following topics: the importance of the IRS campaign in malaria control, methods for proper mixing of insecticide, best practices in indoor spraying of eligible structures, correct use of PPE, cleaning spray pumps and waste disposal, filling operator's forms, and

communication of IEC messages. In addition, all SOPs received practical training on how to set up and use a soak pit and clean it after use. Focus was put on the use of control flow valves (CFVs) and the importance of moving belongings from the rooms of structures before spraying.

Training of M&E Assistants/DEC (July 13 - 15, 2016 in South East and August 24- 26,2016 in the East Coast): The M&E Assistants and data entry clerks (DECs) worked with the IRS campaign data entry forms, and the system used by AIRS Madagascar to enter spray campaign data in the database. M&E Assistants were also told how to use M&E supervision forms (data collection verification tools, data entry verification tools and error elimination tools).

Training of warehouse keepers (July 13 - 14, 2016 in the South East; August 24 and 25, 2016 in the East Coast): Warehouse keepers were trained on the management of inventories, the importance of filling and maintaining stock cards, and the proper procedures for the storage of PPE and insecticides. The two central warehouse managers were involved in the training in order to share their best stock management practices with the seasonal store keepers.

Training of washers (July 23, 2016 in the South East; September 3, 2016 in the East Coast): Washers were trained on the proper techniques to wash PPE.

Training of public health workers in management of poisoning with insecticide (July 21, 2016 for Farafangana and July 22, 2016 for Vohipeno in the South East. August 26, 2016 for Fenerive Est, September 3, 2016 for Brickaville and Tamatave II in the East Coast): AIRS Madagascar's staff was able to provide training on poison management to physicians, nurses and midwives at public health centers in intervention districts.

Training of Drivers (July 18, 2016 in the South East; August 29, 2016 in the East Coast): Drivers were advised on their duties and role in helping spray teams perform their work. Drivers learned how to transport mobile soak pits. They were also trained on the management of insecticide spills.

Training of IEC Trainers (July 6 and 7, 2016 in the South East; August 15 and 16 and 18, 2016 in the East Coast, One day per district): Sector Managers were trained on appropriate messages to be communicated; best practices in conducting door-to-door mobilization; filling data collection forms on the mobilization; and identification of structures eligible for the spray campaign. They also reviewed the methods used to supervise IEC activities and to ensure that data collection for the identification of eligible structures was performed correctly.

Training of IEC Mobilizers (July 6 or 7 or 8 or 9, 2016 in the South East; August 16 or 17 or 18 or 19, 2016 in the East Coast, One day per commune): IEC Mobilizers were trained on how to effectively communicate messages and implement best practices for door-to-door mobilization. They also learned to guide spray operators during the campaign and were trained on how to complete mobilization data collection forms and properly mark structures.

3. IEC MOBILIZATION

3.1 MOBILIZATION METHODOLOGY

AIRS Madagascar organized awareness-raising events before and during the IRS campaigns, working with media channels, producing and distributing various IRS promotional materials and directly contacting beneficiaries through door-to-door mobilization to inform them of the IRS campaign schedule and its benefits for malaria control. For mobilization activities this year, AIRS Madagascar worked closely with the NMCP/DLP to conduct IEC activities. The project adopted the following working methodology to conduct mobilization:

- Reviewed key policy documents (National Malaria Control Strategic Plan, PMI Strategy Papers on IRS messages, etc.).
- Discussed and planned IEC/ Social Behavior Change Communication (SBCC) mobilization activities in collaboration with the IEC/SBCC team of NMCP/DLP.
- Conducted meetings with the traditional, Health and Administrative Authorities in the regions, districts, communes, and fokontany.
- Conducted advocacy meetings in each district with local and traditional leaders in collaboration with Peace Corps Volunteers (PCVs), specifically 3 in Vohipeno, and 6 in Brickaville.
- Trained seasonal staff involved in the implementation of IEC/ SBCC activities (mobilizers and their supervisors).
- Disseminated IEC materials in the intervention communes and *fokontany*.
- Conducted door-to-door mobilization.
- Aired radio messages on all radio stations with a wide geographical coverage.
- Organized radio broadcasts with the participation of IEC officials from the public health system to strengthen advocacy at all levels.
- Provided supervisory training and ensured supervision of field mobilization teams.
- Recruited the chief of fokontany, as a paid IEC mobilizer responsible for community mobilization in his village working closely with Community Health Workers

3.2 ADVOCACY

To ensure the involvement of local leaders in the spray campaign, AIRS Madagascar led several advocacy activities. This helped the project to minimize refusals from beneficiaries. The activities included:

- Organizing an advocacy workshop in each district with the participation of all authorities in the project intervention regions and districts (traditional leader, administrative and districts authorities) both in the South East and East Coast. Those authorities conducted local meetings and door to door mobilization based on their advocacy action plan to increase IRS acceptance. PCVs were involved in the advocacy workshops and sensitization together with the IEC Mobilizers and local authorities.
- Organizing advocacy actions in the communes and *fokontany* before and during IRS campaigns in the

following forms: courtesy visits, meetings with local authorities, information sessions at different levels (communes and *fokontany*) with the involvement of all social actors; and participation in various official meetings in the districts, communes and *fokontany*, to strengthen advocacy and IRS messages and to share information about the spraying program in localities. As local leaders, chiefs of *fokontany* were engaged to carry out IEC mobilization in their villages working closely with CHWs. Their positions helped ensure easy community mobilization and increase IRS acceptance.

3.3 DOOR-TO-DOOR MOBILIZATION

Door-to-door mobilization was implemented from July 18 - 23, 2016 in the South East and from August 29 - September 3, 2016 in the East Coast. Due to the lessons learned from the last campaign IEC mobilizers worked for twelve days (six days before and six days during the campaign, according to the spray operations plan) with the chief of the *fokontany* as an IEC team member. Mobilizers worked under the supervision of the Sector Managers supported by the District Coordinators, the IEC Officer and the Operations Manager. With the new IEC strategy both in South East and East Coast, AIRS Madagascar was able to conduct more in depth planning for IEC mobilization to make sure that mobilizers work to reach all households in the *fokontany*. As a result, there was higher acceptance of IRS, because they were delivered by people that were from within the households' communities. For the 2016 IRS campaign, the team worked at the village level with the chief of village as lead supported by the CHWs.

Collaboration with others implementing partners like the USAID-funded *Mikolo* Project and PCVs was an added value for the AIRS Madagascar Project.

Mobilizers and their supervisors conducted mobilization activities before spraying and during spraying by accompanying SOPs in the villages on the spray day. Banners were used to reinforce IEC messages. The following four categories of messages were used during mobilization activities:

- Advocacy messages targeting local authorities and leaders;
- Messages for communities on the advantage and the effect of IRS;
- Messages for families on preparing homes; and
- Messages for SOPs on approaches they should adopt and precautions they should take during spraying.

With NMCP/DLP national and regional staff, an IEC mobilization activity was reinforced to address non acceptance of IRS. The table below summarizes the IEC mobilization results for the East Coast and the South East. From the IEC forms completed by the IEC mobilizers

TABLE 5: MOBILIZATION RESULTS

	Structures			Population Reached			IRS		
Area	Found	Sensitized	Not Sensitized	Total	Males	Females	Accepted	Not Accepted	Materials Distributed
Brickaville	34,755	33,279	1,476	72,983	34,629	38,354	32,398	848	33,126
Fenerive Est	63,085	60,270	2,815	146,388	69,282	77,106	58,040	2,804	58,895
Toamasina II	42,080	39,101	2,979	83,120	39,377	43,743	37,016	2,894	39,128
Farafangana	79,517	75,665	3,852	198,555	90,290	108,265	72,417	4,494	69,238
Vohipeno	26,984	24,435	2,549	61,281	28,293	32,988	22,749	3,700	25,608
TOTAL	**246,421**	**232,750**	**13,671**	**562,327**	**261,871**	**300,456**	**222,620**	**14,740**	**225,995**

Next year, AIRS Madagascar will continue with advocacy meeting at commune level to make sure that all the "small kings" and "big kings" are involved. Maintain IEC messages to reinforce the advantages of accepting IRS to prevent malaria even though they may not like the smell of the insecticide. The team will also standardize mobilization activities with local authorities to reach all households and increase acceptance of IRS. Approved IEC pamphlets will be distributed before the next spray campaign.

3.4 OTHER IEC ACTIVITIES

Door-to-door mobilization was complemented with other IEC activities in the form of mass communication, including the distribution of three types of updated materials that were used during the 2016 campaign, flyers, banners and informative posters. Prior to the spray campaign, all materials were reviewed jointly with the NMCP/DLP communication service to match the Malagasy government's requirements and strategy. The project distributed 142,250 flyers in the East Coast, 133,700 flyers in South East and 3,380 posters in the South East and 5,500 posters in the East Coast during mobilization. In addition, AIRS Madagascar fashioned and distributed 3,054 tee-shirts and 3,063 caps for mobilizers and partners. Ninety six banners were put up in all communes of the five districts. The project also aired radio messages in local languages in collaboration with local radio stations, with broad geographic coverage in the project's intervention regions and districts to strengthen IRS messages and disseminate the spraying schedules. AIRS Madagascar developed and aired specific pre-spray and spray period messages. The team aired 105 radio spots in the South East and 228 spots in the East Coast, for a total of 333 radio spots.

4. IRS IMPLEMENTATION

4.1 IRS CAMPAIGN SCHEDULE

Once the SOP training sessions were completed, IRS implementation began immediately. The spray campaign in the South East, Farafangana and Vohipeno Districts, was implemented from July 25-August 22, 2016. In the East Coast, districts of Tamatave II, Brickaville and Fenerive Est were sprayed from September 5- October 1, 2016.

The 2016 IRS launching ceremony lead by the Minister of Health and the USAID Madagascar Health, Population and Nutrition (HPN) Office Director, took place in Vohipeno District in August 2016 and benefited from the participation of the Minister of Commerce, parliamentarians, Senators, local and traditional authorities, the WHO Country Representative, UNFPA, USAID and PMI Madagascar team.

FIGURE 2: SOPS AND OFFICIALS AT THE LAUNCHING OF THE 2016 IRS CAMPAIGN

4.2 ORGANIZATION OF THE IRS CAMPAIGN

"Communalization" was adopted as the IRS technical approach for the campaign. Seasonal workers were recruited in their communities with the support of local authorities. At the district and commune level, seasonal staff decisions were made jointly between the district coordinator and local authorities. SOPs continued to work in their communes or in neighboring areas. A risk assessment was conducted and provided the team with the ability to assess local circumstances. This approach adapted to local setting and highly cost effective, is called "communalization."

AIRS Madagascar grouped spray operators in each commune in two to three operational sites depending on the size of the district. Each operational site had a soak pit and a warehouse large enough to serve several spray teams. A total of 104 mobile soak pits (MSPs) (40 for the South East and 64 for the East Coast) were built and used in remote areas. Additionally, there were 53 permanent soak pits and warehouses (24 in the South East and 29 in the East Coast) for the 2016 IRS campaign.

Each morning, every District Coordinator organized breakfast for Spray teams (SOPs and TLs) before they went to work. Breakfast was an opportunity for the team supervisors and sector manager to communicate recommendations and instructions based on information from the daily debriefing the day before.

Vehicles were available to support operations implementation: transportation of PPE for washing and insecticides. They were used to transport SOPs and back to the operational sites in the late afternoon, where spray teams conducted progressive rinsing to properly remove liquid waste (rinsing spray pumps and washing PPE, except for overalls) in soak pits. At the end of each day, SOPs handed their completed spray forms to their Team Leaders, who checked and compiled them before submitting them to their Sector Manager. Spray forms were then sent to data entry centers for immediate entry into AIRS Madagascar's database. The number of spray teams and SOPs employed during the 2016 IRS campaign are shown in Tables 6 below.

TABLE 6: NUMBER OF SPRAY TEAMS PER DISTRICT

Region	District	Number of spray teams	Number of SOPs
South East	Vohipeno	32	158
	Farafangana	57	285
	Total South East	**89**	**443**
East Coast	Brickaville	33	169
	Fenerive Est	58	290
	Tamatave II	42	210
	Total East Coast	**133**	**669**
TOTAL		**222**	**1,112**

5. POST-SPRAY ACTIVITIES

5.1 IRS MATERIALS AND EQUIPMENT

After completion of the IRS campaign, SOPs, washers, team leaders, sector managers, couriers, and district coordinators brought back all PPE, used bottles of insecticide and all the other IRS products to their assigned storage rooms. All the items were inspected and recorded on the final stock records. Then, District Coordinators, the Logistics Manager and Logistics Assistant worked together to bring back all PPE, solid wastes and other materials from all storage rooms to the central warehouses in Farafangana and Toamasina. Trucks, boats, and pick-up trucks were used for that operation and a given supervisor (Storekeeper, Sector Manager, Logistics team, District Coordinator) was assigned to monitor the transportation until the items were received and recorded in the central warehouse.

5.2 POST-SEASON INVENTORY

Prior to the spray campaign, AIRS Madagascar had 7,744 bottles of organophosphate in stock. AIRS Madagascar procured 45,468 additional bottles of Actellic® 300CS to cover the spray campaign both in the South East and the East Coast. 5,288 bottles were used in Vohipeno, 11,512 in Farafangana, 11,901 in Tamatave II, 8,834 in Brickaville and 15,677 in Fenerive Est. All the remaining stocks of 2015 and the procured bottles of insecticides were used during the spray campaign. In 2016, AIRS Madagascar used a total of 53,212 bottles of Actellic® 300CS with zero stock at the end. The empty bottles will be recycled by Adonis, a local firm who has the capability and the authorization from MoE to do so. Other materials and equipment out of use will be incinerated by Adonis or recycled.

6. ENVIRONMENTAL COMPLIANCE

6.1 ENVIRONMENTAL COMPLIANCE

AIRS Madagascar operated under a supplemental environmental assessment (SEA) approved by USAID in September 2013, which authorizes the use of three classes of pesticides (pyrethroids, organophosphates and carbamates) nationwide for the 2013-2018 period. AIRS Madagascar submitted a Letter Report, which outlined planned changes in operations from previous campaigns.

6.2 CHALLENGES AND PRECAUTIONS

In 2016, a new district was added in the South East. As this was the first campaign in Vohipeno, AIRS Madagascar's Environmental Compliance Officer (ECO) conducted an environmental reconnaissance trip to the area from February 26 - March 6, 2016. The main economic activities of the districts are:

- The cash crop (pepper, coffee, cloves, lychee)
- Beekeeping and sale of honey in some rural communities

These activities required strict compliance with BMPs for sensitive areas. Specific measures were taken to avoid all contamination when spraying these areas:

- Minimum distance of 30 meters between the structure to be sprayed and beehive or *Ravintsara* culture
- All harvested crops were removed from structures before spraying
- Close supervision in these areas was conducted during spraying

Information and guidelines on spraying methods close to protected areas was communicated to District Coordinators and Sector Managers.

The eastern region included two organic farming areas, a palm tree plantation in Fanandrana and a curcuma plantation in all localities in the communes of Anivorano Est and Razanaka. These organic farming areas were granted the same consideration as other protected areas. As a result, the project did not spray these areas this year.

Like the East Coast, in Farafangana there are numerous streams and rivers to be crossed to reach the communes to be sprayed. Due to the substantial risk of insecticide spills in the rivers at these crossings, AIRS Madagascar implemented measures as detailed in the PMI Best Management Practices (BMP) Manual to prevent negative impacts on the environment.

- Full and empty insecticides bottles were packed in blue and waterproof plastic barrels
- Other equipment was covered with waterproof tarpaulins
- The raft or canoe carrying insecticides and IRS equipment did not carry other people or other goods at the same time, except the person who piloted them
- The crossing was done under the supervision of the ECO or another AIRS staff member

TABLE 7 : LIST OF COMMUNES THAT REQUIRED RIVER NAVIGATION

District	Operation Site	Commune	Duration	Observation
Farafangana	Evato	Beretra Bevoay	1h	Calm water
Farafangana	Maheriraty	Ambalavato Nord	3h	Calm water
Vohipeno*	Sahalava	Sahalava	45min	Calm water
Toamasina II	Toamasina II	Amboditandroho	3h	Calm water
Toamasina II	Antetezambaro	Tanambao Nosibe	2h	Calm water
Fenerive Est	Vohipeno	Vohipeno	2h + walk for 1 hour	River with rapids
Fenerive Est	Antsiatsiaka	Antsiatsiaka	3h	Calm water
Fenerive Est	Ambanja	Ambanja	2h	Calm water
Brickaville	Andovoranto	Andovoranto	1h	Calm water

*Sahalava in Vohipeno is also accessible by road/car or by foot, in addition to river navigation.

6.3 PRE-SEASON ENVIRONMENTAL COMPLIANCE ASSESSMENTS

AIRS Madagascar conducted a pre-season environmental assessment from May 18 - July 24, 2016 in South East (Farafangana and Vohipeno) and from June 13 - September 4, 2016 in the East Coast (Toamasina II, Brickaville and Fenerive Est). The pre-season assessment was conducted using smartphones with PMI standard environmental compliance checklists. The checklist contained questions to ensure that operational sites, with special emphasis on soak pits and warehouses, were properly set up before spraying. They also guided AIRS Madagascar's staff in checking that all PPE and insecticides were delivered and safely stored in warehouses and that seasonal staff working in the warehouses or with soak pits had received appropriate training. Smartphones were also used to collect data on the coordinates of each operational site visited in the geographic information system and to take photos of soak pits and warehouses to show what repairs were needed, or that they were ready. The ECO found that numerous sites needed to be repaired to meet the standards required for IRS. Please see Annex C for the full list of repairs performed. In Farafangana, because of the proximity of the ground water (less than 50 cm below ground) AIRS Madagascar had to install a soak pit 1 km away from the warehouse.

In 2016, AIRS Madagascar translated all documents Material Safety Data Sheet, guide to first aid, recommendation in case of spill, warning sign) into Malagasy. Also, before the campaign all seasonal staff underwent medical checkups and women had to pass a pregnancy test.

6.4 ENVIRONMENTAL COMPLIANCE ACTIVITIES DURING THE CAMPAIGN

AIRS Madagascar's staff conducted inspections to ensure that spray operations met environmental compliance standards as specified in the BMP. These inspections included monitoring the use of PPE, progressive rinsing of spray pumps, vehicles used to transport spray teams and insecticides, storage conditions of PPE and insecticides and warehouses displaying warning signs. The staff also monitored whether IRS waste was managed and stored properly, that stock cards at warehouses were accurate and that the SOPs were using the proper spray techniques. In addition, the staff checked that beneficiaries had received clear information about the IRS campaign and knew how to prepare their

structure for spraying. AIRS Madagascar continued to check the condition of fixed and mobile soak pits, specifically for their flow and drainage. Overall, AIRS Madagascar's staff found that spray operations were satisfactory but a few environmental compliance issues were identified. GEMS conducted an environmental compliance assessment before and after the IRS campaign and made some recommendations, which were taken into consideration by Abt

For the destruction of expired insecticide by ADONIS, an environmental impact study was conducted by a consultant. AIRS is currently waiting for its validation by the National Office of Environment to proceed with ADONIS.

The non-compliance issues observed by the AIRS Madagascar staff during the 2016 IRS campaign and the measures taken to address them are listed in the Table 9 below.

TABLE 8: ENVIRONMENTAL COMPLIANCE ISSUES NOTED DURING SUPERVISION

Difficulties	Districts	Measures taken by AIRS
Use of schools for storerooms	Farafangana, Vohipeno	Specific measures were taken to avoid all contamination and to prevent negative impacts (layout places, decontamination process)
Some Hudson spray pumps leaked.	Toamasina II, Fenerive Est, Brickaville	Leaky pumps were collected and either repaired or replaced and a spill kit was used for proper cleaning.

6.4.1 MOBILE SOAK PITS

AIRS Madagascar built upon previous success and expanded the use of mobile soak pits (MSPs) for the 2016 IRS campaign. The number of MSPs has increased by 40 (107 in 2016 versus 67 in 2015)

FIGURE 3: MOBILE SOAK PIT

6.5 TYVEK SUIT PILOT

In 2016, AIRS Madagascar piloted the use of Tyvek suits for spray operators who used mobile soak pit.

The advantages of using Tyvek suits instead of cotton coveralls are:

- Lightweight
- Can be used for several days before washing them in the fixed soak pit, but rather they can be decontaminated daily by the use of wipes.
- Spray operators can clean them themselves, thus allowing them to clean during overnight camping.

Five teams have tested Tyvek suits for a week as listed in Table 9 below.

Points for Improvement:

- The Tyvek suit is very delicate as it rips very easily. Some suits ripped the very first day of use.
- The Tyvek suit is very thin and not strong enough for sprayers who use metal pumps (Hudson). It would be best to use Tyvek with Goizper pumps where there is a dual shoulder strap that provides more comfort to the sprayers.
- Wiping Tyvek suits with wipes can also be time consuming, which affects the sprayers who are tired and hungry by the end of the day
- The white color makes visible the mud stains that cannot be removed with wipes

TABLE 9: LOCATIONS OF TYVEK SUIT PILOTS

	Districts	Communes
South East	Farafangana	Mahavelo
		Ambohimandroso
East Coast	Toamasina II	Toamasina Sub Urbaine
	Brickaville	Ambinaninony
	Fenerive Est	Mahambo

6.6 POST-SEASON ENVIRONMENTAL COMPLIANCE ACTIVITIES

Post-season environmental inspections took place from August 22 – September 2, 2016 in the South East and from October 3 - October 14, 2016 in the East Coast. The main objective of the inspections was to ensure that all soak pits and warehouses had been properly closed out. All the warehouses were emptied of materials and equipment used during spraying. After these items and insecticides had been removed, warehouses were decontaminated with water mixed with bleach and soap. This decontamination was performed before handing the premises back to the owners. All soak pits were covered with a concrete lid to prevent people from accessing materials and from interfering with insecticide-waste degradation process in the soak pit.

At the end of the campaign, all mobile soak pits were returned to the warehouse. Containers, buckets, and sponges that were not damaged were decontaminated and stored for reuse. Those that were unable to be reused were classified as IRS waste. Screens were removed and considered as waste to be treated. All these activities were supervised by AIRS Madagascar's Environmental Compliance Officer together with a representative of the NMCP/DLP staff who has received training on environmental compliance organized by AIRS Madagascar in Senegal. As part of his capacity building process, he benefited from practical training during the pre, during and post spraying activities.

FIGURE 4: SEALING A SOAK PIT

6.6.1 IRS CAMPAIGN WASTE DISPOSAL

The following MSP items were decontaminated and will be reused if not damaged:

- White plastic buckets of 25 L used for the manufacture of new models of mobile soak pit
- Sponges
- Plastic sheets

AIRS Madagascar will work with Adonis, who operates an incinerator in Tamatave, and the necessary equipment in Antananarivo to recycle eligible items, such as plastics and metal. AIRS Madagascar currently owns a stock of worn overalls, boots, gloves and pumps. The gloves and boots contain greater than 1% chlorine. If incinerated, they can create dangerous persistent organic pollutants (POPs). After decontamination (washing them with soap and water), AIRS Madagascar will dispose of such materials by offering them to spray staff.

AIRS Madagascar has started the process to obtain special authorization from ONE to allow ADONIS to incinerate the expired pesticide (5,936 sachets of pyrethroids, 4,643 sachets of carbamates and 3,020 bottles of organophosphates).

7. MONITORING AND EVALUATION

7.1 M&E OBJECTIVES AND METHODOLOGY

AIRS Madagascar had a number of lessons learned from the 2015 campaign and in accordance with the 2016 work plan, improvements were introduced to the M&E system for the 2016 campaign, with the goal of:

- Ensuring the accuracy of data collected and entered through training and supervision at all levels;
- Streamlining and standardizing data processing to minimize errors;
- Ensuring data security according to established protocols.

M&E activities were led by the M&E Officer and the Database Manager.

7.2 DATA MANAGEMENT AND PROCESSING

7.2.1 DATA COLLECTION

Data collection followed the protocols described in the 2016 work plan. The data collection forms were developed to ensure the collection of all indicators requested by PMI. Before the beginning of each mobilization and spraying operation, those involved in data collection were trained in the data collection process and in filling forms. Data on mobilization were collected by mobilizers who conducted door-to-door visits, and data on the spray by SOPs. Data collection forms went through several checks before being entered into the database.

7.2.2 DATA ENTRY

AIRS Madagascar employed a total of 43 DECs (20 in the South East and 23 in the East). Each district had its own data entry center. Each DEC entered the data from the forms into the project's database. At the end of each day, DECs sent a copy of the database in the "cloud" (online DropBox server) to forward the most recent data. DECs entered first the "total" for reporting purposes and then the "details" line by line in order to ensure accuracy of the data entered. The data entry was completed within two weeks after the end of the campaign.

7.2.3 STORAGE OF DATA

All data collection forms were stored in filing cabinets. They were filed by district, commune, and *fokontany*, and finally by date. At the end of the campaign, the forms were transferred and stored at the central warehouse (in Farafangana and Tamatave) in a secure location with limited access.

At the end of each day, all the files in the database were stored electronically in two different ways:

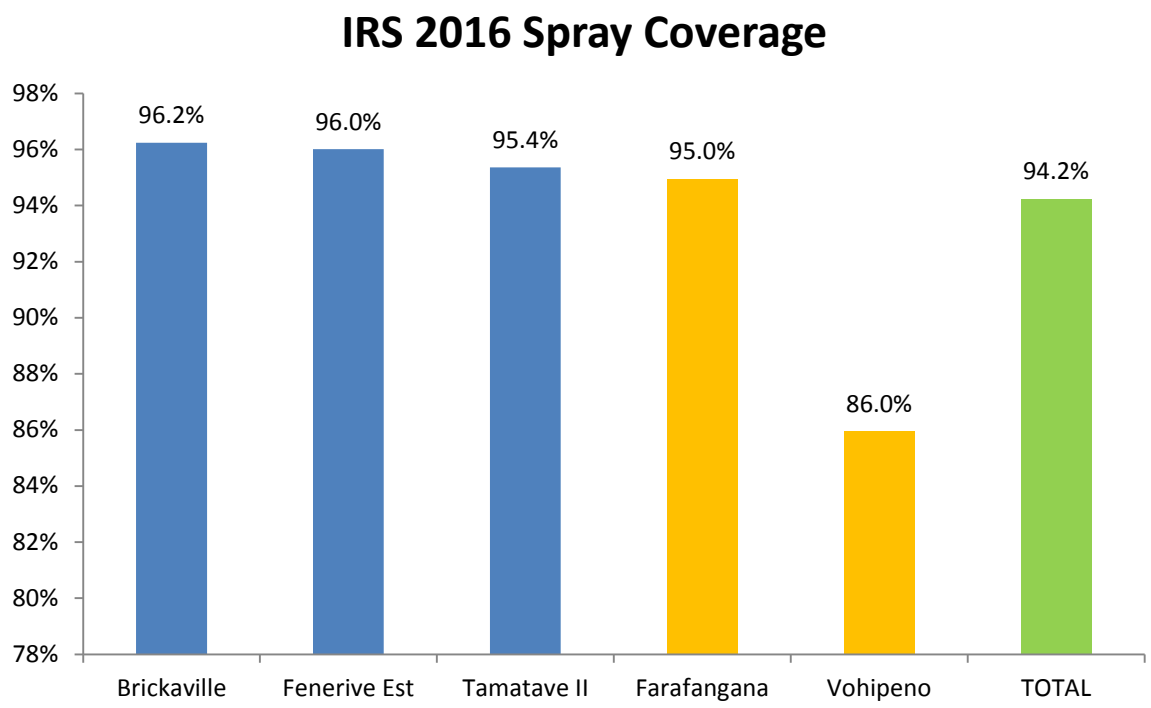
- In the "Back-up" folder available on the computer of DEC
- On the online Dropbox server

7.3 RESULTS

7.3.1 NUMBER OF ELIGIBLE STRUCTURES FOUND AND SPRAY COVERAGE

The number of structures found by spray operators was 329,395 (130,706 in the South East and 198,689 in the East), and the number of structures sprayed by spray operators was 310,426 (119,959 in the South East and 190,467 in the East Coast). In the South East, SOPs sprayed 91.8% of all structures found, and 95.9% % of all structures in the East Coast. The total coverage rate achieved was 94.2% as indicated in Table 11.

FIGURE 5: IRS 2016 SPRAY COVERAGE



7.3.2 POPULATION PROTECTED

IRS provided protection to 1,257,036 people (552,764 in South East and 704,272 in the East) including 47,508 pregnant women and 184,927 children under 5 years old. The details are presented in Table 10 below.

TABLE 10: SUMMARY OF SPRAY RESULTS

Area	District	Structure found by SOP	Structures Sprayed	Spray coverage	Population protected	# Pregnant Women	# Children <5 years
East	Brickaville	52,000	50,046	96.2%	183,775	6,648	24,044
	Fenerive Est	82,417	79,129	96.0%	305,223	11,582	30,762
	Tamatave II	64,272	61,292	95.4%	215,274	7,998	29,639
Total East		**198,689**	**190,467**	**95.9%**	**704,272**	**26,228**	**84,445**
South East	Farafangana	84,497	80,236	95.0%	377,513	15,211	69,675
	Vohipeno	46,209	39,723	86.0%	175,251	6,069	30,807
Total South East		**130,706**	**119,959**	**91.8%**	**552,764**	**21,280**	**100,482**
TOTAL IRS 2016		**329,395**	**310,426**	**94.2%**	**1,257,036**	**47,508**	**184,927**

7.3.3 USE OF INSECTICIDE AND PERFORMANCE OF SPRAY OPERATORS

AIRS Madagascar used 53,212 bottles of organophosphates (16,800 in the South East and 36,412 in the East). On average, each SOP sprayed 13.7 structures per day in the South East and 14.6 in the East. One bottle of organophosphate sprayed 7.1 structures in the South East, while operators in the East sprayed 5.2 structures per bottle. The difference is due to the average size of structures in the South East, which are smaller than in the East..

Table 11 shows the average numbers of structures covered by a bottle of insecticide, by district.

TABLE 11: INSECTICIDES USED PER DISTRICT AND SOP PERFORMANCE

Zone	District	Structures sprayed	Insecticide used	Average number of structures sprayed by SOP per day	Average number of structures sprayed per bottle
East Coast	Brickaville	50,046	8,834	14.3	5.6
	Fenerive Est	79,129	11,901	14.7	4.7
	Tamatave II	61,292	15,677	14.0	5.1
Total East Coast		**190,467**	**36,412**	**14.4**	**5.1**
South East	Farafangana	80,236	11,512	14.7	6.8
	Vohipeno	39,723	5,288	12.6	6.7
Total South East		**119,959**	**16,800**	**13.9**	**6.8**
Grand Total		**310,426**	**53,212**	**14.2**	**6.0**

At the end of the campaign, there was no insecticide left. A new stock will be ordered for the 2017 spray campaign.

7.4 DATA QUALITY ASSURANCE

Data quality assurance activities were implemented both for data collection and data entry verification, using the project supervision tools, and standard database audit control. AIRS found that these tools formalized self-audits of the IRS campaign data for better data quality, and reduced the number of errors encountered in the operators' everyday forms as well as in the M&E database. Table 12 below shows the number of forms used for each data quality assurance tool and the percentage of forms audited.

TABLE 12: NUMBER OF SUPERVISORY TOOLS USED

Supervision tools for M&E	Number of forms used	Percentage checked
Error Eliminator (mandatory usage)	31,986	100% of the spray forms
Data Collection Verification (453 structures)	453	0.14% of structures found
Data Entry Verification (27,344 structures)	1,823	12.1% of structures found

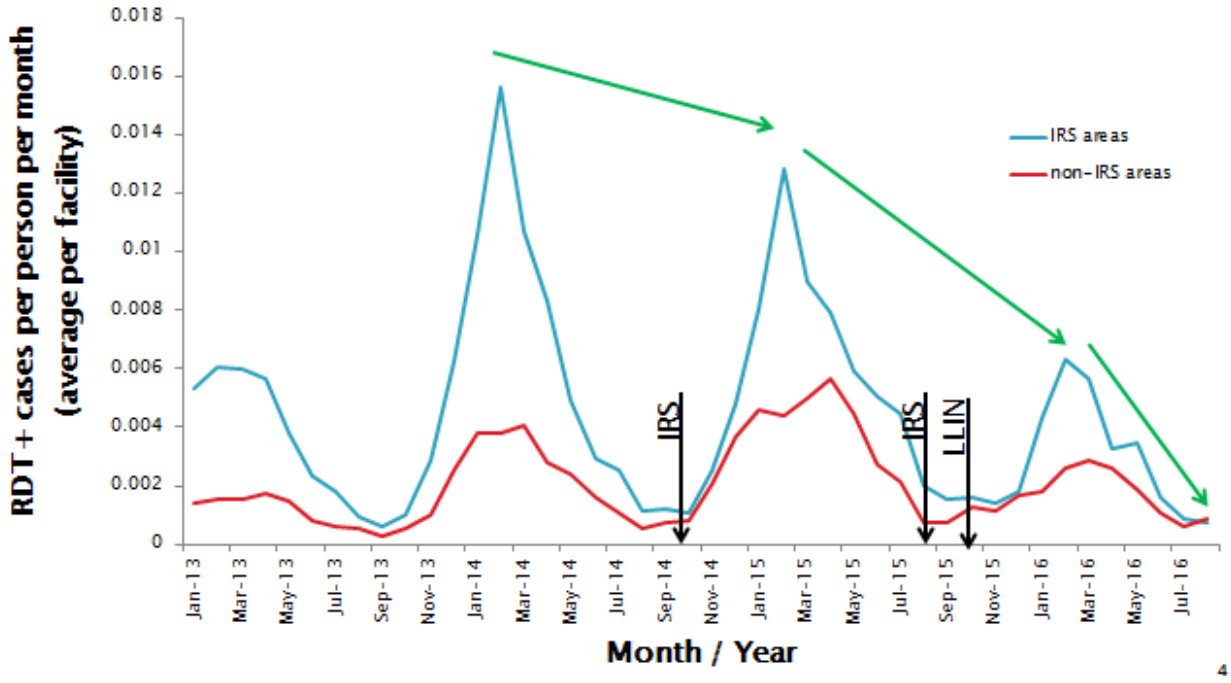
Starting this year, each supervisor used the electronic version of the Data Collection Verification (DCV) tool to interview households to verify spray coverage data. Staff visited and interviewed residents from 453 structures (0.14% of structures found) during the campaign. Areas where the DCV was implemented were chosen based on the spray coverage rate as reported by SMS data. Common data collection inconsistencies were primarily due to a variance in the population-protected count and structure marking, which was corrected in situ by the supervisor.

At the end of every week, the M&E Assistant met with the District Coordinator and Sector Managers to discuss the spray progress and the errors found using the data quality assurance tools. Furthermore, the AIRS Madagascar M&E Manager and Database Manager provided feedback regarding errors found on spray operator cards and gave recommendations to the AIRS Madagascar Operations team to minimize future errors on the spray operator cards.

7.5 EPIDEMIOLOGICAL DATA COLLECTION

AIRS Madagascar collected epidemiological data in five districts (three IRS and two comparison districts). This data was collected at the national level (NMCP/DLP) and the AIRS Madagascar team analyzed the rate of confirmed malaria cases over the total district population in our spray districts, Brickaville, Fenerive Est, and Tamatave II, and in our comparison districts, Soanierana Ivongo, Vavantenina. AIRS Madagascar has done a regression analysis which showed up 20% decrease in RDT+ cases for children under age 5 as the contribution of IRS.

FIGURE 6: UNADJUSTED RDT+ CASES PER PERSON PER MONTH (ALL AGES)



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8. ENTOMOLOGY

Under the supervision of the AIRS Madagascar's Technical Director, the project's four entomological surveillance teams (each consisting of an entomologist and two assistants) performed all entomological surveillance activities. Given that the entomological surveillance is currently ongoing and a final entomological report will be submitted in June 2017, this section presents a brief summary of some results of entomological surveillance conducted in 2016. It covers entomological monitoring activities performed from June 2016 to September 2016 in the South East and from August 2016 to September 2016 in the East.

8.1 ENTOMOLOGICAL SURVEILLANCE SENTINEL SITES

In April 2015, AIRS Madagascar and the vector control committee of the NMCP selected entomological monitoring sentinel sites for 2015. In 2016, the decision was to drop one of the sentinel sites located in the south, replaced by a new one in the South East: Lanivo in Vohipeno district. All the other sites for 2015 continue to be monitored in 2016.

Ankafina Tsarafidy (district of Ambohimahasoa), Vavatenina (district of Vavatenina) and Lopary (district of Vangaindrano) were selected as control sentinel sites, respectively, for the Central Highlands, the East Coast and the South East. They are located in communes that have not been sprayed.

All sentinel sites where entomological surveillance was performed during the 2016 IRS campaign are listed in Tables 13 and 14.

TABLE 13: ENTOMOLOGICAL SURVEILLANCE SITES

Intervention zone	District	Sentinel sites	Observations
CHL	Ambositra	Imerina Imady	Sentinel site since the 2014-2015 campaign, pyrethroid spray area.
	Fandriana	Milamaina	Sentinel site since the 2014-2015 campaign, carbamate spray area.
	Finanaratsoa II	Vohimarina	Sentinel site since the 2014-2015 campaign, carbamate spray area.
	Ambohimahasoa	Ankafina Tsarafidy	Control sentinel site for CHL.
East Coast	Brickaville	Ambodifaho	Sentinel site, since the

Intervention zone	District	Sentinel sites	Observations
			2014-2015 campaign, organophosphate spray area.
	Toamasina II	Vohitrambato	Sentinel site, since the 2014-2015 campaign, organophosphate spray area.
	Fenerive Est	Mahambo	Sentinel site since the 2014-2015 campaign, organophosphate spray area.
	Vavatenina	Vavatenina	Sentinel site in non sprayed area used as a control site.
South East	Farafangana	Manambotra Sud	sentinel site in the organophosphate spray area.
	Vangaindrano	Lopary	sentinel site in non sprayed area used as a control site.
	Vohipeno	Lanivo	New sentinel site in the organophosphate spray area.

8.2 ENTOMOLOGICAL SURVEILLANCE BASELINE STUDY

Baseline entomological data was collected one month before the start of the IRS campaign in two spray zones (in June 2016 in the South East Coast and in August 2016 in the East Coast). The East Coast has three sites which were used for baseline data collection: Ambodifaho (Brickaville district), Vohitrambato (Toamasina II district), Mahambo (Fenerive Est district) and one control site, Vavatenina. The South East had two sites used for baseline data collection: Manambotra Sud (Farafangana district), Lanivo (Vohipeno district) and one control site, Lopary in Vangaindrano district. The sampling methods used were Human Land Catch (HLC), Pyrethrum Spray Catch (PSC) and hand collections using an aspirator. In both areas, baseline data indicated that the *Anopheles gambiae* s.l., was the most common vector species.

- *An. gambiae* s.l., *An. funestus* and *An. mascarensis*, the three vectors of malaria in Madagascar, were found in Toamasina II (Vohitrambato), and in Vavatenina (control site of the East).

- In Vavatenina, *An. gambiae* s.l. is the most prevalent in number in the baseline data collection (50.0%), followed *An. funestus* (31.8%) and *An. mascarensis* (18.8%), while *An. mascarensis* is the most prevalent in Vohitrambato (57%), followed by *An. funestus* (34.9%) and *An. gambiae* s.l. (7.3%)

- During this investigation, *An. funestus* was absent in Ambodifaho (Brickaville), Mahambo (Fenerive Est) and Manambotra Sud (Farafangana); *An. mascarensis* was not found in Lopary (Vangaindrano), Lanivo (Vohipeno) and Ambodifaho (Brickaville).

- The baseline data collected before spraying showed in Vohitrambato, Ambodifaho, and Lopary, *An. gambiae s.l.* has an exophagic tendency, while it has an endophagic tendency in Manambotra Sud (Farafangana) and Mahambo, but the difference is not significant. However, *An. gambiae* is significantly endophagic in Vavatenina ($p=0.001$ for a cut off of 0.05)

- The room vector density was low (0 to 0.8 vector per room):
  Before spraying, it was 0.1, 0.4, and 0, respectively in Manambotra Sud, Lanivo and Lopary (control site), during the investigation period in the South East, and 0.4, 0.8, 0 and 0 respectively in Mahambo, Ambodifaho, Vohitrambato and Vavatenina, in the East; then, the density is 0 everywhere, after spraying.

- The baseline data show the parity rate for *An. gambiae* s.l. was high in Vohitrambato (100%), Ambodifaho (100%), Vavatenina (87.5%), Mahambo (100%), Lanivo (100%), Manambotra Sud (100%), but was low in Lopary (33.3%).

- Non-anopheline mosquitoes accounted for more than 57.8% of all the mosquitoes collected in the East Coast and 65.6% in the South East. All vectors have been preserved for further laboratory analysis that included identification of species by PCR and detection of sporozoites by ELISA test with some sample.

The following table shows the results from HLC baseline data collection:

TABLE 14: BASELINE HLC DATA COLLECTION RESULTS PRIOR TO SPRAYING

Sites	Species	HLC In (# mosquitos captured)	HLC out (# mosquitos captured)	Total (# mosquitos captured)	Endo. rate	Exo. rate	MBR in (# bites per person per night: b/p/n)	MBR out (b/p/n)
Mahambo Fenerive Est	*An. gambiae* s.l.	2	0	2	2/2	0	0.33	0
	An. funestus	0	0	0	0	0	0.00	0
	An. mascariensis	3	6	9	33.3	66.7	0.50	1
	Other *Anopheles*	3	2	5				
	Culicinae	24	51	75				
Brickaville Ambodifaho	*An. gambiae* s.l.	4	11	15	26.67	73.33	0.67	1.83
	An. funestus	0	0	0	0	0	0	0
	An. mascariensis	0	0	0	0	0	0	0
	Other *Anopheles*	2	0	2				
	Culicinae	102	38	140				
Tamatave II Vohit	*An. gambiae* s.l.	3	4	7	42.86	57.14	0.50	0.67

Sites	Species	HLC In (# mosquitos captured)	HLC out (# mosquitos captured)	Total (# mosquitos captured)	Endo. rate	Exo. rate	MBR in (# bites per person per night: b/p/n)	MBR out (b/p/n)
	An. funestus	14	24	38	36.84	63.16	2.33	4.00
	An. mascariensis	10	47	57	17.54	82.46	1.67	7.83
	Other *Anopheles*	8	106	114				
	Culicinae	13	118	131				
Vavatenina (control East)	*An.gambiae* s.l.	3	18	21	14.29	85.71	0.50	3.00
	An. funestus	8	9	17	47.06	52.94	1.33	1.50
	An. mascariensis	2	6	8	25.00	75.00	0.33	1.00
	Other *An.*	0	26	26				
	Culicinae	5	19	24				
Farafangana Manambotra Sud	*An. gambiae* s.l.	1	0	1	1/1	0	0.2	0
	An. funestus	0	0	0	0	0	0	0
	An. mascariensis	3	0	3	3/3	0	0.5	0
	Other *Anopheles*	0	0	0				

Sites	Species	HLC In (# mosquitos captured)	HLC out (# mosquitos captured)	Total (# mosquitos captured)	Endo. rate	Exo. rate	MBR in (# bites per person per night: b/p/n)	MBR out (b/p/n)
	Culicinae	0	0	0				
Vangaindrano Lopary (control South East)	*An. gambiae* s.l.	0	4	4	0	4/4	0	0
	An. funestus	4	7	11	4/11	7/11	0.7	1.7
	An. mascariensis	0	0	0	0	0	0	0
	Other *Anopheles*	15	22	37				
	Culicinae	22	46	68				
Vohipeno, Lanibvo)	*An. gambiae* s.l.	16	24	40	40.00	60	2.67	4.00
	An. funestus	5	9	14	35.71	64.29	0.83	1.50
	An. mascariensis	0	0	0	0.00	0.00	0.00	0.00
	Other *Anopheles*	0	5	5				
	Culicinae	127	185	312				

The following table shows the results from PSC and ODC for the baseline data collection:

TABLE 15: BASELINE PSC AND ODC DATA COLLECTION RESULTS PRIOR TO SPRAYING

Sites	Species	PSC #	Ind. Rest. rate	ODC #
Mahambo Fenerive Est	*An. gambiae* s.l.	4	0.4	0
	An. funestus	0	0	0
	An. mascariensis	0	0	3
	Other *Anopheles*	2		5
	Culicidae	15		32
Brickaville Ambodifaho	*An. gambiae* s.l.	8	0.8	2
	An. funestus	0	0	0
	An. mascariensis	0	0	0
	Other *Anopheles*			
	Culicidae			
Tamatave II Vohitrambato	*An. gambiae* s.l.	0	0	1
	An. funestus	0	0	0
	An. mascariensis	2	0.2	4
	Other *Anopheles*			1

Sites	Species	PSC #	Ind. Rest. rate	ODC #
	Culicidae			4
Vavatenina (control East)	*An. gambiae* s.l.	0	0	11
	An. funestus	2	0.2	1
	An. mascariensis	0	0	4
	Other *An.*			1
	Culicidae			2
Farafangana Maambotra Sud	*An. gambiae* s.l.	1	0	0
	An. funestus	0	0	0
	An. mascariensis	3	0	3
	Other *Anopheles*	0		0
	Culicidae	0		0
Vangaindrano Lopary (control South East)	*An. gambiae*	0	0	2
	An. funestus	0	0	0
	An. mascariensis	0	0	0

Sites	Species	PSC #	Ind. Rest. rate	ODC #
	Other *Anopheles*	0		0
	Culicidae	0		0
Vohipeno Lanivo (control South East)	*An. gambiae*	4	0.4	1
	An. funestus	5	0.5	2
	An. mascariensis	0	0	0
	Other *Anopheles*	0		0
	Culicidae	0		0

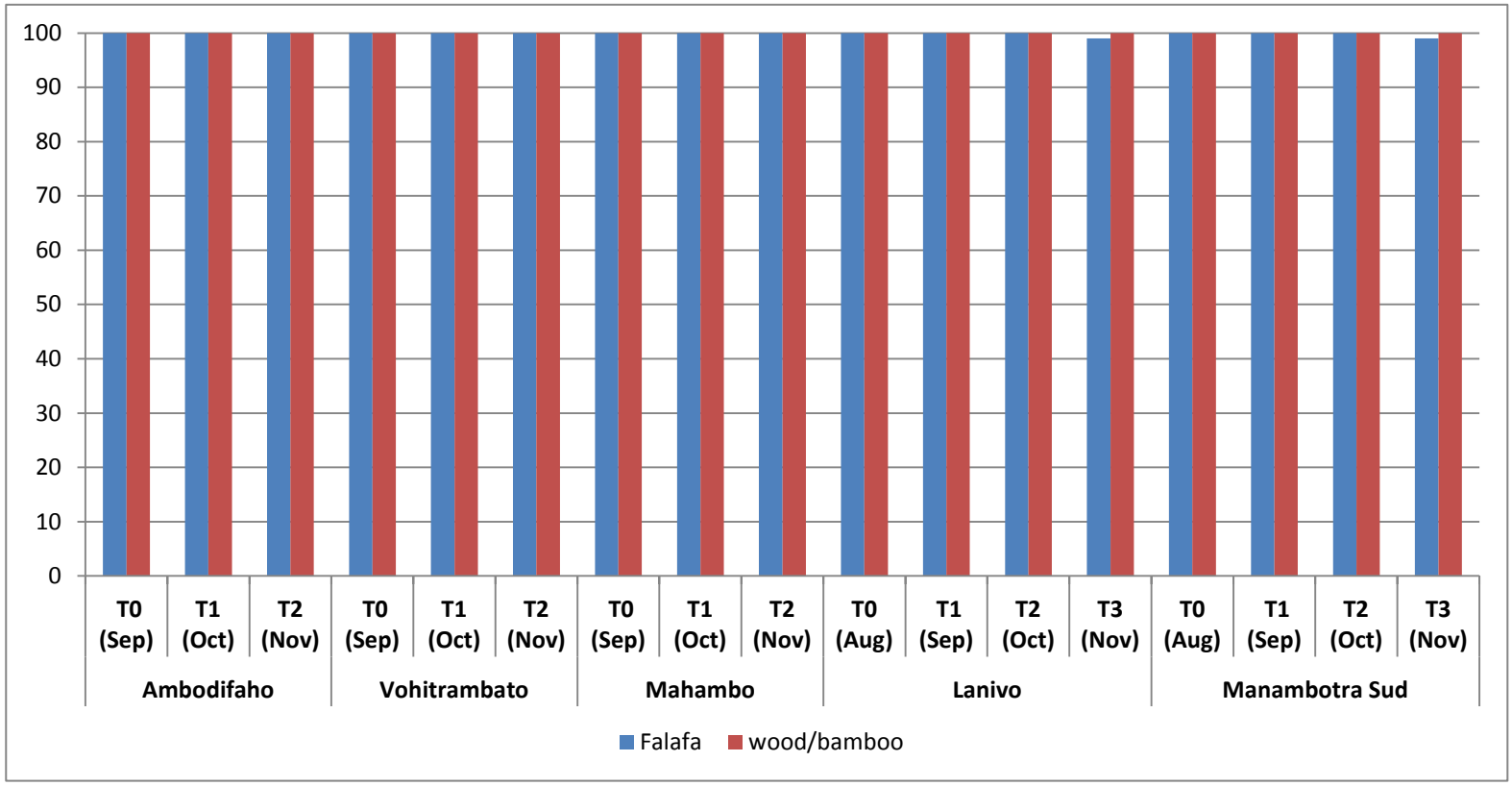
8.3 CONE BIOASSAY TEST RESULTS

AIRS Madagascar conducted monthly cone bioassay tests using the WHO procedure to assess the residual effectiveness of insecticides sprayed during the 2015 IRS campaign. The tests were conducted in the following sentinel sites: Ambodifaho (district of Brickaville), Vohitrambato (district of Toamasina II), and Mahambo (district of Fenerive Est) in the East Coast; Manambotra Sud (district of Farafangana) and Lanivo (district of Vohipeno) in the South East. Since Madagascar does not have a susceptible mosquito colony (Kisumu strain), all cone bioassay tests were performed with local wild adult mosquitoes reared from field-collected larvae and pupae. The mosquitoes were exposed to the sprayed surfaces for 30 minutes and the "knock-down" rate was recorded at 30 minutes and 60 minutes post exposure. The vector mortality was observed after a 24- hour recovery period. The residual life of pirimiphos-methyl Actellic® 300CS (an organophosphate) was tested in the sentinel sites of Brickaville, Vohitrambato and Mahambo, in the East and Manambotra Sud and Lanivo in the South East.

At the East Coast sites (Ambodifaho, Brickaville; Vohitrambato, Toamasina II; Mahambo, Fenerive Est) and the South East Coast sites (Manambotra Sud, Farafangana; Lanivo, Vohipeno), most houses have a wall made up of wood or *falafa* (branches of traveler's palm).

During the first week of IRS campaigns in the East Coast and in the South East, AIRS Madagascar conducted cone bioassay tests to assess whether the quality of the spraying was satisfactory. The results indicated that the spray quality, both in the East Coast and in the South East, was good, mortality being 100% for all the structures sampled. In the South East three months after spraying (T3 October 2016), and in the East coast, two months after spraying (T2 November 2016) pirimiphos-methyl Actellic® 300CS retained a 100% effectiveness; In The south East the effectiveness is 99% , four months after spraying (T4 November 2016) (Fig. 12).

FIGURE 7: RESIDUAL EFFECTIVENESS OBSERVED FOR PIRIMIPHOS-METHYL CS 300 (ORGANOPHOSPHATES) IN THE EAST COAST AND SOUTH EAST



8.4 INSECTICIDE SUSCEPTIBILITY TESTS

Susceptibility testing with all classes of insecticides recommended by WHO, synergists tests and determination of resistance intensity will be performed and partial results will be available at end of November 2016.

8.5 OTHER FINDINGS FROM ENTOMOLOGICAL SURVEILLANCE

- *An. gambiae* s.l. human biting rates were low, except in Vavatenina and Ambodifaho, outdoor and Lanivo indoor and outdoor before spraying. In most spray areas, the vector biting rates inside houses have decreased post spraying in comparison with the baseline. This could be due to either the killing effect or the repellent effect of the insecticide (Table 15).
- The indoor resting density collected using the Pyrethrum Spray Catch (PSC) was very low in all the sentinel sites, both at the baseline and post spray (Table).
- *An. gambiae* s.l. appeared to have exophagic tendency both in the East and in the South East but this is only the results observed one month after spraying in the South East and the month where spraying occurred in the East, so that statistical test for comparison was not done and delayed for later.

It is likely that the use of a large number of LLINs contributed to the outdoor bite patterns.

The tables below summarize the data collected on aggressive density (HLC), density per room (PSC), and behavior of *An. gambiae* s.l., during the period of investigation.

TABLE 16: DENSITY OF *AN.GAMBIAE* S.L. OBSERVED DURING INVESTIGATIONS

Sites	Month	Indoor (bites/person/night)	Outdoor (bites/person/night)
Ambodifaho, Brickaville	August*	0.7	1.8
	September	0.2	1.2
Vohitrambato, Toamasina II	August*	0.5	0.7
	September	1.2	5.8
Mahambo, Fenerive Est	August*	0.3	0.0
	September	0.0	0.3
Vavatenina, control East (control site for east)	August*	0.5	3.0
	September	0.2	1.2
Manambotra Sud, Farafangana	June*	0.2	0.0
	July	0.0	0.0
	August	0.0	0.0
	September	0.0	1.5
Lopary, Vangaindrano, control South East (control site for south East)	July*	0.0	0.7
	August	1.0	1.2
	September	0.0	0.2
	October	0.0	0.2
Lanivo, Vohipeno	July*	2.7	4.0
	August	1.8	1.5
	September	0.2	0.3
	October	0.0	0.5

* baseline month

TABLE 17: DENSITY PER ROOM FOR *AN. GAMBIAE* S.L., AFTER PSC PSC UNDER MORNING RESIDUAL FAUNA COLLECTION

Area	Sites	June	July	August	September
East	Ambodifaho			0.8	0
	Mahambo			0.4	0
	Vohitrambato			0	0
	Vavatenina			0	0
South East	Manambotra Sud	0.1	0	0	0
	Lopary	0	0	0	0
	Lanivo	0.4	0	0	0

TABLE 18: ENDOPHAGY RATE (%) FOR *AN. GAMBIAE* S.L, OBSERVED DURING THE INVESTIGATIVE PERIOD

Areas	Sites	June	July	August	September
East	Ambodifaho			26.7	12.5
	Mahambo			100.0	0
	Vohitrambato			42.9	16.7
	Vavatenina	40		14.3	12.5
South East	Manambotra Sud	100	0	0	0
	Lopary	0	46.2	0	0
	Lanivo	40.0	55.0	33.3	0.0

9. GENDER

AIRS Madagascar emphasized increasing the number of women hired during the 2016 IRS campaign, especially in supervisory roles. The team met and spoke with local authorities about the key role of women for the project and communities. During the recruitment process, women candidates were prioritized if they met the job requirements. To help them to feel comfortable during their work, AIRS Madagascar used Goizper pump in the South East which is relatively lighter to carry than Hudson pumps. The project ordered new overalls and boots which correctly fit to most of Malagasy women's sizes.

Before the campaign began, the gender focal point trained all staff on gender awareness and sexual harassment. The same training was given during the training of trainers for seasonal staff.

The project conducted a survey on a group of seasonal staff before the start of the campaign and then again at the end. This was done in compliance with Institutional Review Board requirements in order to measure the effects of altering the work place with messages to employees regarding gender equality.

During the campaign, gender awareness and sexual harassment guidelines (see Annex) were posted in each warehouse. In addition, the project sent a daily SMS reminder to each team leader and sector manager on gender awareness and sexual harassment. To date, there have not been complaints regarding sexual harassment reported to the project gender focal point.

TABLE 19: COMPARISON OF PROPORTIONS OF WOMEN IN SUPERVISORY ROLE BETWEEN IRS CAMPAIGNS IN 2014, 2015 AND 2016 BY SEX (PERCENTAGE OF WOMEN)

Position	IRS Campaign 2014	Proportion	IRS Campaign 2015	Proportion	IRS Campaign 2016	Proportion
M&E Assistant	0/8	0.0%	3/4	75.0%	3/5	60.0%
Finance Assistant	8/8	100.0%	3/4	75.0%	5/6	83.3%
Sector Manager	3/46	6.5%	20/65	30.8%	29/98	29.6%
Team Leader	22/111	19.8%	99/198	50.0%	110/222	49.5%
TOTAL	**33/173**	**19.1%**	**125/271**	**46.1%**	**147/331**	**44.4%**

Instead of recruiting an IEC Supervisor, the project has hired Sector Managers one month before the start of the spray campaign to supervise IEC/BCC activities in each spray area. This could explain this decrease in comparing with last year's campaign.

TABLE 20: COMPARISON OF PROPORTIONS OF WOMEN IN SPRAY TEAM BETWEEN IRS CAMPAIGNS IN 2014, 2015 AND 2016 , BY SEX (PERCENTAGE OF WOMEN)

Position	IRS Campaign 2014	Proportion	IRS Campaign 2015	Proportion	IRS Campaign 2016	Proportion
Sector Manager	3/46	6.5%	20/65	30.8%	29/98	29.6%
Team Leader	22/111	19.8%	99/198	50.0%	110/222	49.5%
Spray Operators	25/559	4.5%	197/960	20.5%	203/1,112	18.3%
TOTAL	**50/716**	**7.0%**	**316/1,223**	**25.8%**	**342/1,432**	**23.9%**

This decrease in the overall percentage of women working with AIRS Madagascar during the 2016 IRS campaign was due to the lack of candidates who met the job requirements (e.g., literacy, etc.), which itself was most likely a product of the cultural context of the new district, Vohipeno. Vohipeno's population is culturally Islamic with relatively fewer women educated and able to seek employment outside the home. This cultural constraint influenced the proportional decrease of women working with AIRS Madagascar during the 2016 IRS campaign, but the total number of women overall increased in all positions.

10. NATIONAL CAPACITY BUILDING

There was an excellent coordination of IRS activities across the RBM partnership, commitment, determination and solid collaboration of the Malaria Control Directorate with Abt Associates US-PMI AIRS in interventions to ensure that malaria is no longer a public health problem in Madagascar. One reason for the success of the 2016 IRS campaign has been effective collaboration between the Malaria Control Directorate (DLP), the Regional Directorates of Health, the District Public Health Services involved and the PMI AIRS project team.

This collaboration took the form of mutual capacity buildings throughout the whole 2016 IRS campaign process. The specificity of this campaign is also the effective participation of the local community, represented by the kings (Ampanjaka/Tanganamana) and chief of Fokontany (village). In the preparatory phase, 4 members of the DLP team participated in the training on the use of a new pump "GOIZPER" for spraying. DLP team participated in the joint planning of the campaign, the various trainings, workshops or advocacy sessions for a successful IRS campaign.

During the campaign, a joint monitoring team DLP-Abt Associates was established to monitor IRS activities. Every day, every district is supervised by at least one team using the Smartphone to facilitate and standardize supervision.

At the end of each day, a "daily debriefing" is organized with the supervision team to analyze the results of the day as well as strengths and areas for improvement.

Moreover, DLP benefited from an insectarium to strengthen its entomological monitoring, analyze and monitor the technical quality of spraying. Today, the DLP and the PMI AIRS team can be proud to have developed a collaboration that can be presented as a national capacity building model.

DLP has managers working in tandem with those of the AIRS project to cover areas ranging from environmental compliance, entomological monitoring through social mobilization, training, logistics management, supervision and field operations' coordination.

As part of this collaboration, the DLP will benefit very soon (in November 2016) from direct support from the AIRS technical team for its focalized spray campaign in Central High lands funded by Global Fund.

11. Challenges and Lessons Learned

AIRS Madagascar encountered several challenges which varied according to the location of the campaign:

- Refusals were the principal challenge faced by the program in Vohipeno district. Refusal were one of the reasons for non-spraying besides door locked, sickness, family event, and other reasons. In 2016, for the East Coast 95.9% of the structures found were sprayed and of the 4.1% of found structures that were not sprayed, 1% were refusals. To improve the spray coverage, AIRS Madagascar organized advocacy meetings and reinforced IEC messaging, increased supervision in areas with the lowest coverage, and worked closely with the NMCP and traditional and local leaders to address the causes of refusals.
    - Some reported reasons for refusals were the insecticide smell and people not feeling comfortable moving out their household objects.
    - Advocacy meetings with traditional and local leaders appear as a key of IRS acceptance. However, it is important to involve both "big and small kings" in the advocacy meetings to avoid high levels of refusal in some villages where "small kings" were feeling neglected by the advocacy process.
    - During the pre-spray mobilization activities, focus needed to be put on IRS acceptance messages and what beneficiaries need to do before, during and after the spray.
    - Goizper spray pumps were really appreciated by SOP and others IRS stakeholders. According to them, it is light, easy to carry, and improve their work.
    - Tyvek suit pilot as PPE for remote areas was successful and accepted by the community and spray teams.
    - Working with others USAID implementing partners like Peace Corps Volunteers and *Mikolo* added value for community molbilization.

    In the common intervention communes of Mikolo and AIRS project such as Vohipeno, Tamatave II, and Brickaville, the mobilizers were the same and were already well experienced in IEC and mobilization for a malaria program. This was an advantage and AIRS did not need to emphasize these themes during the IEC training session.
    -
- Distance and access to remote areas required spray operators to walk long distances within the commune to find and spray structures.
- The use of mHealth, and especially the organization of the daily debriefing with staff and governmental officials was very helpful to adjust the field strategy when needed.
- Local authorities and health personnel should remain part of IRS supervision teams.

The followings are recommendations for next year's campaign:

- Continue with communalization as the IRS implementation approach.

- Reduce the use of mobile soak pits in future campaigns, for better compliance with environmental requirements and for cost saving. Build permanent soak pits when necessary.
- Continue the use of mHealth tools since they are helpful for daily spray progress monitoring and supervision. For the upcoming spray campaign, it will be good to continue to have the sector manager as the primary SMS sender in the system.
- E-Inventory pilot was very successful and helpful not only for the use of insecticide but also to better manage others materials, equipment and items in the central warehouses. AIRS Madagascar will document and continue to use e-Inventory system.
- Continue to strengthen efforts to substantially increase the percentage of women among seasonal workers, particularly in supervisory roles and on spray teams.
- Continue IEC/ SBCC mobilization strategies based on lessons learned two IEC mobilizers per village including the chief of *fokontany* and use of sector manager as supervisor. AIRS Madagascar should continue to work closely with local leaders since they have the capacity to motivate people and encourage them to accept IRS
- Goizper pumps should be used in all sites for IRS campaigns.

ANNEX A: ITEMS PROCURED INTERNATIONALLY

Item	Stock before the campaign	Quantities purchased	Quantity used	Quantity in stock after the campaign	Notes
Goizper pumps	0	600	536	600	
Gloves for Spray Operators	1135	1080	1080		
Masks	9,000	39,630			
Activated charcoal	40				
Actellic® 300CS insecticide	7744	45,468	53,212	0	

ANNEX B: SITE REPAIRS

Area	District	Operational sites	# of permanent soak pit	# of store rooms	Repairs made
East	Fenerive Est	Ambatoharanana	1	1	New construction
		Vohilengo	1	1	New construction
		Ampasimbe Manantsatrana	1	1	Old soakpit re-use
					Fence repaired
		Ampasina Maningory	2	1	New construction
		Mahambo	2	1	New construction
		Mahanoro	2	1	New construction
		Antsiatsiaka	1	1	New construction
		Vohipeno	1	1	New construction
		Fenerive Centre	2	1	Old soakpit re-use
					Fence repaired
	Toamasina II	Antetezambaro	1	1	New construction
		Foulpointe	1	1	New construction
		Lazaret	1	1	New construction
		Sahambala	1	1	New construction
		Ampasimadinika	1	1	New construction
		Ambodilazana	1	1	New construction
		Amboditandroho	1	1	New construction
		Andranobolahy	1	1	New construction
		Andondabe	1	1	New construction
	Brickaville	Brickaville centre	1	1	Old soakpit re-use
					Fence repaired
		Anjahamana	1	1	New construction
		Mahatsara	1	1	New construction
		Ambalarondra	1	1	New construction
		Andovoranto	1	1	New construction
		Ranomafana	1	1	Old soakpit re-use
					Fence repaired
South East	Vohipeno	Vohipeno	1	1	New construction
		Mahazoarivo	1	1	New construction

		Zafindrafady	1	1	New construction
		Andemaka	1	1	New construction
		Vohindava	1	1	New construction
		Ifatsy	1	1	New construction
		Lanivoa	1	1	New construction
		Vohitrindry	1	1	New construction
		Savana	1	1	New construction
	Farafangana	Farafangana	1	1	New construction
		Evato	1	1	Old soakpit re-use
		Anosy Tsararafa	1	1	New construction
		Ambalatany	1	1	New construction
		Mahabo mananivo	1	1	New construction
		Ihorombe	1	1	New construction
		Vohilengo	1	1	New construction
		Etrotroka	1	1	New construction
		Maheriraty	1	1	New construction
		Iabohazo	1	1	New construction
		Efatsy	1	1	New construction
		Ankarana	1	1	Old soakpit re-use
					Fence repaired

ANNEX C: NUMBER OF PEOPLE TRAINED

TABLE 21: NUMBER OF PEOPLE TRAINED, DISAGGREGATED BY GENDER

South EAST																								
Categories of Persons Trained	Training on IRS Delivery								Other Trainings															
	Training of Trainers: Spray Ops		Spray Operations		Data Entry		Logistics		IEC Mobilization		Public Health Training		PPEs Washing		Financial training		Enumeration training		Security		Transportation	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Central Logistic Assistant							1	0																
E-Inventory Data Entry Clerk							0	1																
Operations Assistant	1	0																						
District Financial Assistant															0	2								
Central Financial Assistant															0	3								
Environmental Compliance Assistant	1	0																						
M&E Assistant					0	2																		
Data Entry Clerk					5	16																		
Sector Manager	40	14																						
Store Keeper							13	41																
Store Room Guard																			74	0				

Team Leader			31	58																		
Spray Operator			360	83																		
Washer													0	58								
IEC Mobilizer									597	287												
Carrier/Porter																					89	0
Public Health Agent											24	41										
Enumerator																	153	119				
Supervisor of enumeration																	14	8				
TOTAL M/F	42	14	391	141	5	18	14	42	597	287	24	41	0	58	0	5	167	127	74	0	89	0
TOTAL/ training	56		532		23		56		884		65		58		5		294		74		89	
Grand TOTAL	**2,136**																					
Total Number of women trained in the SOUTH EAST	**733**																					
Total Number of men trained in the SOUTH EAST	**1,403**																					

EAST

Categories of Persons Trained	Training on IRS Delivery								Other Trainings													
	Training of Trainers: Spray Ops		Spray Operations		Data Entry		Logistics		IEC Mobilization		Public Health Training		PPEs Washing		Financial training		Enumeration training		Security		Transportation	
	M	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
Financial Assistant															1	3						
E-Inventory Data Entry Clerk							0	1														
M&E Assistant					2	1																
Data Entry Clerk					8	15																

Sector Manager	29	15																				
Store Keeper							9	31														
Store Room Guard																			46	2		
Team Leader			81	52																		
Spray Operator			549	120																		
Washer													2	72								
IEC Mobilizer									499	351												
Carrier/Porter																					133	0
Public Health Agent											29	45										
TOTAL M/F	29	15	630	172	10	16	9	32	499	351	29	45	2	72	1	3	0	0	46	2	133	0
TOTAL/ training	44		802		26		41		850		74		74		4		0		48		133	
Grand TOTAL	**2,096**																					
Total Number of women trained in the East	**708**																					
Total Number of men trained in the EAST	**1,388**																					
Total Number of Women Trained in the SOUTH EAST and EAST	1,441																					
Percent Women Trained in the SOUTH EAST and EAST	34.1%																					
Grand Total Number of People Trained in SOUTH EAST and EAST	**4,232**																					

ANNEX D: GENDER AWARENESS AND SEXUAL

Fitsipika eto anivon'ny tetik'asa CAID momba ny fanararaotana ara-nofo

Ny tetik'asa PMI AIRS (projet PID na CAID) dia mikatsaka toeram-piasana mirindra ho an'ny mpiasa rehetra na lehilahy na vehivavy.

Hahafahana manantanteraka izany dia **tsy ekena** eto anivon'ny tetik'asa **ny toetra sy ny fihetsika tsy mendrika hahiana hiteraka korontana sy tahotra eo anivon'ny mpiasa:**

- ny fananararaotana ara-nofo (harcelement sexuel)
- Ny fanavankavahana isan-karazany momba ny fihaviana, firazanana, ny lokon'ny volon-koditra, ny finoana, ny taona ary ny kilema

Inona no atao hoe fanararaotana ara-nofo?

Ny fanararaotana ara-nofo dia ireo teny na fihetsika ataon'olona iray mikatsaka firaisana ara-nofo tsy niriana amina olona iray hafa mba hahazoan'ity farany tombotsoa.

Izany fanararaotana ara-nofo izany dia mety hiteraka fandrahonana, tahotra ary tebiteby eo anivon'ny toeram-piasana ka mety hanankorotana ny asan'ny mpiasa.

Inona avy koa ireo endrika fanankorotanana hafa eo anivon'ny asa?

Eo anivon'ny asa dia mety hisy koa ireo fanankorotanana hafa miendrika fandrahonana, ompa, fanambaniana, fanendrikendrehana tsy mitombina na fikasiha-tanana mihitsy.

Fametrahana fitarainana eo anivon'ny tetik'asa PMI AIRS (PID na CAID)

Ny mpiasa eto anivon'ny tetik'asa PID dia afaka miantso an'ity laharana eto ambany ity raha sendra teny na fihetsika miendrika fanararaotana ara-nofo:

033 37 117 62

Mr Arnaud RAKOTONIRINA

Responsible suivi-evaluation / point focal genre

Izy no hanadihady sy haka ny fepetra ilaina miaraka amin'ny "Service des Ressources Humaines" an'ny tetik'asa PID.

Ny fampitahorana mpiasa mametraka fitarainana dia tsy ekena velively.

Azo atao ihany koa ny mametraka fitarainana amin'ireto laharana ireto:

Abt Helpline : 888-928-4231 na www.integrity-helpline.com/abtassoc.jsp

ANNEX E: MEP INDICATOR MATRIX

Last Updated: 02/11/2016

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
Component 1: Establish cost-effective supply chain mechanisms and execute logistical plans								
1.1 Procurement								
1.1.1 Number and percentage of insecticide procurements that had a pre-shipment QA/QC test at least 60 days prior to spray campaign	*Data source*: Project records – insecticide procurements *Reporting frequency*: Each spray campaign	By Spray Campaign	1; 100%	1;100%	1;100%	1:100%	; 100%	
1.1.2 Number and percentage of international insecticide procurements delivered in country, at port of entry, at least 30 days prior to the start of spray operations	*Data source*: Project records – international procurements *Reporting frequency*: Each spray campaign	By Spray Campaign	1; 100%	1;100%	1;100%	1:100%	100%	
1.1.3 Number and percentage of international equipment procurements, including PPE, delivered in country, at port of entry, at least 30 days prior to start of spray operations	*Data source:* Project records *Reporting frequency*: Each spray campaign	By Spray Campaign	1; 100%	1;100%	1; 100%	1:100%	; 100%	

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
1.1.4 Number and percentage of local procurements for PPE delivered 14 days before the start of spray operations	*Data source:* Project records *Reporting frequency*: Each spray campaign	By Spray Campaign	1; 100%	1; 100%	1;100%	1:100%	100%	
1.1.5 Successfully completed spray operations without an insecticide stock-out	*Data source:* Project records *Reporting frequency*: Each spray campaign	By Spray Campaign	Completed	Completed	Completed	Completed	Completed	
1.2 In-Country Exemption and Custom Clearance Process								
1.2.1 Complete exemption and clearance process within the minimum 2 weeks	*Data source:* Project records *Reporting frequency:* Each spray campaign	By Spray Campaign	Completed	Completed	Completed	Completed	Completed	
1.3 In-Country Logistics, Warehousing, and Training								
1.3.1 Number and percentage of logistics and warehouse managers trained in IRS supply chain management	*Data source*: Training records *Reporting frequency*: Each spray campaign	By Spray Campaign By Gender	109;100% M : 50% F: 50%	72;100% M:19 F: 53	94; 100% M:50% F:50%	95:100% M: 23 F: 72 (75.8%)	; 100%	
1.3.2 Number and percentage of base stores where physical inventories are verified by up-to-date stock records	*Data source:* Project records *Reporting frequency*: Each spray campaign	By Spray Campaign	108;100%	10;100% South East:3 East Coast: 7	93; 100%	53:100% South East: 24 East Coast: 29	; 100%	

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
1.3.3 Submit up-to-date inventory records 30 days after the end of each spray campaign	*Data source:* Project records *Reporting frequency*: Each spray campaign	By Spray Campaign	Completed	Completed	; Completed	Completed	; 100%	
Component 2: Implement safe and high-quality IRS programs and provide operational management support								
2.1 Planning and Design of IRS Programs								
2.1.1 Annual PMI AIRS country work plan developed and submitted on time	*Data source:* Project records *Reporting frequency*: Annually	By Spray Campaign	Completed	Completed	Completed	Completed	Completed	
2.1.2 Percentage reduction in project operational expenses per structure from the previous year,excluding insecticide costs .	*Data source:* Project financial records *Reporting frequency*: Annually	By Spray Campaign	5%	42%	5%	42%	5%	
2.2 Support of Safety and Health Best Practices and Compliance with USAID and Host Country Environmental Regulations								
2.2.1 SEA/letter reports submitted on time based on schedule agreed upon with the-PMI COR team	*Data source*: Project records – submitted SEAs/ letter reports Reporting frequency: Each spray campaign	By Spray Campaign	Completed	Completed	Completed	Completed	Completed	
2.2.2 Number of spray personnel trained in environmental compliance and personal safety standards in IRS implementation[1]	Data source: Project records – Training reports Reporting frequency: Each spray season	By Spray Campaign By Gender	1,219 M: 853 F: 366	1,223 M: 907 F: 316	1,447	1,433 M: 1,091 F: 342	TBD	
2.2.3 Number of health	Data source: Project records –	By Spray	114	95	102	139	TBD	

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
workers receiving insecticide poisoning case management training	Training reports Reporting frequency: Each spray season	Campaign By Gender		M:42 F: 53		M: 53 F: 86		
2.2.4 Number of adverse reactions to pesticide exposure documented	Data source: Incident report forms Reporting frequency: Each spray campaign	By Spray Campaign By Residential/ occupational exposure	0	0	0	0	0	
2.2.5 Number and percentage of soak pits and storehouses inspected and approved prior to spraying	Data source: Project records – Reports submitted by district environmental officers Reporting frequency: Each spray season	By Spray Campaign By Soak Pit By Storehouse	100%	23;100% Soak Pit: 13 Warehouse:10	11:100% Warehouse:93 SoakPit: 17	53:100% Warehouse: 53 Soakpit: 53 Mobile soak pit :107	100%	
2.3 Conduct Communications Activities and Community Mobilization								
2.3.1 Number of radio spots and talk shows aired	Data source: Project records Reporting frequency: Per spray campaign	By Spray Campaign	342	162 East Coast:108 South East: 54	1,620	333 East Coast: 333 South East: 105	TBD	
2.3.2 Number of IRS print materials disseminated	Data source: Project records Reporting frequency: Semi-annually	By Spray Campaign By Type of printed material and	263,738 Leaflet : 256 000 Booklet : 138 Poster : 7600	204,631 Leaflet: 197,031 Poster:	370,500 Leaflet: 361,000 Poster	231,591 Leaflet: 225,995 Poster: 5,500	TBD	

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
		message(s)		7,600	9,500	Banners: 96		
2.3.3. Number of people reached with IRS messages via door-to-door mobilization	Data source: Mobilization Data Collection Forms Reporting frequency: Daily per mobilization conducted	By Spray Campaign By Gender	949,961	416,634 M:185,634 F:231,270	485,475	562,327 M: 261,871 F: 300,456	TBD	
2.4 Spray Targeted Structures According to Technical Specifications								
2.4.1 Number of structures targeted for spraying	Data source: Previous spray campaign data, enumeration data (targets); Daily Spray Operator Forms (results) Reporting frequency: Daily per spray campaign	By Spray Campaign	230,126 South EAST: 72,120 EAST: 158,006	268,829 South EAST:81,941 East Coast:186,888	308,565 South East 119,751 East Coast: 188,814	329,395 East Coast: 198,689 South East: 130,706	TBD	
2.4.2 Number of structures sprayed with IRS	Data source: Daily Spray Operator Forms Reporting frequency: Daily per spray campaign	By Spray Campaign	195,607 (85 % of 230,126)	247,902 South East: 75,782 East Coast: 172,120	262,281 (85% of 308,565)	310,426 South East: 119,959 East Coast: 190,467	TBD	
2.4.3 Percentage of total structures targeted for spraying that were sprayed with a residual insecticide (Spray Coverage)	Data source: Daily Spray Operator Forms Reporting frequency: Daily per spray campaign	By Spray Campaign	85%	92.2%	85%	94.2%	85%	

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
2.4.4 Number of people residing in structures sprayed (Number of people protected by IRS)	Data source: Daily Spray Operator Forms Reporting frequency: Daily per spray campaign	By Spray Campaign By Gender By pregnant women By children <5 years old	807,467 (85 % of 949,961)	1,016,841 M: 510,854 F: 505,987 Pregnant Women: 36,241 Children<5: 147,682	1,031,633 (85% of 1,213,687)	1,257,036 M:631,154 F: 625,882 Pregnant Women: 47,508 Children<5: 184,927	TBD	TBD
COMPONENT 3: ONGOING MONITORING AND EVALUATION AND QUALITY CONTROL MEASURES								
3.1 Submit AIRS COUNTRY M&E Plan to PMI for approval	Data source: Project records Reporting frequency: Semi-annual	By Spray Campaign	Completed	Completed	Completed	Completed	Completed	
3.2 Conduct a post-spray data quality audit within 60 days of completion of spray operations	Data source: Spray operations reports Reporting frequency: Per spray campaign	By Spray Campaign	Completed	N.A	N.A	N.A	Completed or N.A.	
COMPONENT 4: CONTRIBUTE TO GLOBAL AND COUNTRY-LEVEL IRS POLICY SETTING AND DEVELOP AND DISSEMINATE EXPERIENCES AND BEST PRACTICES								
4.1 Number of guidelines/checklists/tools related to IRS operations developed or refined with project support	Data source: Project records – Activity reports Reporting frequency: Semi-annually	By Spray Campaign By guideline/ checklist/tool	1 Gender awareness guidelines	1 Gender awareness guidelines	1 Gender awareness guidelines	2 Gender awareness guildelines Team leader	TBD	

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
						supervisory forms		
4.2 Number of articles/best practices documents published	Data source: Project records – Activity reports Reporting frequency: Semi-annually	By Spray Campaign By IRS Technical Area	1	1 Operations	1	1 Operations	TBD	
4.3 Number of best practice presentations given at national/ regional/international workshops and conferences	Data source: Project records – Activity reports Reporting frequency: Semi-annually	By Spray Campaign By IRS Technical Area	1	1 Operations	1	1 Operations	TBD	
4.4 Number of enterprises engaged through public-private partnerships	Data source: Project records – Activity reports Reporting frequency: Semi-annually	By Spray Campaign	N/A	N/A	1	0	TBD	
Component 5: Contribute to the collection and analysis of Routine entomological and epidemiological data								
5.1 Support entomological monitoring activities and insecticide resistance strategies								
5.1.1 Number of entomological sentinel sites supported by the PMI AIRS Project established to monitor vector bionomics and behavior (vector species, distribution, seasonality, feeding time, and location)	Data source: Entomological reports Reporting frequency: Annually	By Spray Campaign	6	6	6	6		

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
5.1.2 Number and percentage of entomological monitoring sentinel sites measuring all the five primary PMI entomological monitoring indicators	Data source: Entomological reports Reporting frequency: Annually	By Spray Campaign	6: 54.5%	6; 54.5%	6: 54.5%	6; 54.5%	TBD	
5.1.3 Number and percentage of entomological monitoring sites measuring at least one secondary PMI indicator	Data source: Entomological reports Reporting frequency: Annually	By Spray Campaign	6; 54.5%	6; 54.5%	6: 54.5%	6; 54.5%	TBD	
5.1.4 Number and percentage of insecticide resistance testing sites that tested at least one insecticide from each of the four classes of insecticides recommended for malaria vector control	Data source: Entomological reports Reporting frequency: Annually	By Spray Campaign By Insecticide class	11: 100%	11: 100%	11: 100%	11: 100%	TBD	
5.1.5 Number of wall bioassays conducted within 2 weeks of spraying to evaluate the quality of IRS	Data source: Entomological reports Reporting frequency: Per spray campaign	By Spray Campaign	4 sentinel sites: 36.4% of the sites; 32 tests/month/site	4 sentinel sites: 36.4% of the sites; 32 tests/month/site	4 sentinel sites: 36.4% of the sites; 32 tests/month/site	4 sentinel sites: 36.4% of the sites; 32 tests/month/site	TBD	

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
5.1.6 Number of wall bioassays conducted after the completion of spraying at monthly intervals to evaluate insecticide decay	Data source: Entomological reports Reporting frequency: Per spray campaign	By Spray Campaign	4 sentinel sites: 36.4% of the sites 32 tests per site/month=128 tests/month	4 sentinel sites: 36.4% of the sites 32 tests per site/month=128 tests/month	4 sentinel sites: 36.4% of the sites 32 tests per site/month=128 tests/month	4 sentinel sites: 36.4% of the sites 32 tests per site/month=128 tests/month	TBD	
5.1.7 Number of vector susceptibility tests for different insecticides conducted in selected sentinel sites	Data source: Entomological reports Reporting frequency: Per spray campaign	By Spray Campaign	396 WHO tube tests* 396 CDC bottles assay	396 WHO tube tests* 396 CDC bottles assay	396 WHO tube tests* 396 CDC bottles assay	396 WHO tube tests* 396 CDC bottles assay	TBD	
5.2 Support Epidemiological Malaria Data Collection and Analysis								
5.2.1 Collect routine epidemiological data	Data source: *Project Reports* Reporting Frequency: Annually	By Spray Campaign	Complete	Ongoing	Completed	On going	TBD	
5.2.2 Number of targeted health facilities with routine epidemiological malaria data collection supported by the PMI AIRS Project	Data source: Epidemiological reports Reporting frequency: Annually	By Spray Campaign	110	110	110	110	TBD	
Component 6 (Cross-cutting): Capacity Building, Knowledge Transfer, Gender Inclusion								
6.1 Increasing the Role of Women and Addressing Gender Barriers								
6.1.1 Number of people trained to deliver IRS in target districts	Data source: Project records – Training reports Reporting frequency: Semi-	By Spray Campaign By Spray	1326	1,319 South East:521	1,447	1,572 South East: 652	TBD	

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
	annually	Campaign By Gender Percentage of Women Trained		East: 798 M:950 F:369 38.8%		East Coast: 920 M:1,144 F: 428 27.2%		
6.1.2 Total number of people trained to support IRS in target districts	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Spray Campaign By Gender Percentage of women trained	3,185	3,302 South East:1,073 East: 2,229 M:1,965 F:1,337 40.5%	3,654 F: 42%	4,134 South East: 2,092 East Coast: 2,042 M: 2,777 F: 1,357 32.8%	TBD	
6.1.3 Number and percentage of women recruited (i.e. number/percentage of women on the selection list) for IRS employment	Data source: Project records – Recruitment reports reports Reporting frequency: Semi-annually	By Country	909 30%	1,337 40.5%	1,560 42%	1,357 32.8%	TBD	
6.1.4 Number of people trained as IRS Training of Trainers	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Gender Percentage of women trained	65 Wmn 26 40%	66 M: 46 F: 20 30.3%	101 F:50 49.5%	100 M:71 F: 29 30%	TBD	
6.1.5 Total number of people hired to support IRS in target districts	Data source: Project records – Contracts signed	By Spray Campaign	3,123	3,237 South	3,714	4,134 South East:	TBD	

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
	Reporting frequency: *Semi-annually*	By Gender Percentage of women hired	Wmn 1200 39%	East:1074 East: 2,163 M:1904 F:1333 41.2%	F: 42%	2,092 East Coast: 2,042 M: 2,777 F: 1,357 32.8%		
6.1.6 Number of women hired in supervisory roles in target districts (this number includes site supervisors, team leaders, M&E assistants and others who supervise seasonal staff)[1]	Data source: Project records – Contracts signed Reporting frequency: Semi-annually	By Spray Campaign Percentage of women hired By role	447 179 40%	195 50% Finance Assistant: 4 M&E Assistant: 3 Supervisor of mobilization: 69 Sector manager: 20 Team leader: 99	338 F: 50%	147 District Finance Assistant: 5 District M&E Assistant: 3 Sector Manager: 29 Team Leader: 110	TBD	
6.1.7 Number of staff (permanent and seasonal) who have completed gender awareness training	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Gender Percentage of	TBD	84 M: 57 F: 27 32.1%	111	128 M: 92 F: 36 28.1%	TBD	

[1]Sector Manager , Team leader, Spray Operators

[1] Team Leader, Sector Manager, M&E Assistant, Supervisor of Mobilization, Finance Assistant

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
		women						
6.2 Capacity Building								
6.2.1 Number of government officials trained in IRS oversight	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Gender Percentage of Women	16	20 M: 9 F: 11 55%	24 F: 20 83%	23 M: 3 F: 19 82.6%	TBD	
6.2.2 Implement all activities outlined in their yearly Capacity Building Action Plan	Data source: Project records – Capacity assessment reports Reporting frequency: Semi-annually	By Spray Campaign	Completed	Completed	Completed	Completed	Completed	
6.2.3 MADAGASCAR government implements at least one aspect of the IRS program independently.	Data source: Project records – MOUs Reporting frequency: Semi-annually	By Spray Campaign	Completed	Completed	Completed	Completed	Completed	
6.2.4 Insectarium-in- box and storage-in- box	AIRS' Contribution to build the capacity of DLP on entomology. It costs $ 22k!							

ANNEX F: IEC MESSAGES

IRS MESSAGES CONVEYED BY IEC/BCC MOBILIZERS

I. OBJECTIVE: Households prepare for IRS and agree to receive SOPs and let them inside their homes.

II. MESSAGES

Messages for Advocacy *(to community leaders)*

- Inform the public in advance of the schedule and goal of IRS.
- Get involved in mobilization
- Facilitate the operation with the community (programming, consultation, etc.)

IEC messages:

–To families:

- **Prepare for spraying:**

  ✓ Prepare 10 liters of water for preparing the product.
  ✓ Remove food, clothing, cooking utensils, drinking water, furniture, etc..
  ✓ Keep animals in a safe place and far enough away from home.
  ✓ Remove anything that is hanging on the walls.
  ✓ Put heavy furniture in the middle of the house.
  ✓ Leave a space in the house to all SOPs to spray all the walls.

- **Receive SOPs:**

  ✓ Give water to the SOPs.
  ✓ Show SOPs the rooms to be sprayed.
  ✓ Let SOPs work unhindered.
  ✓ Stay out of the house.

- **After spraying:**

  ✓ Do not wash the walls after spraying.
  ✓ Close all doors for 2 hours before opening.
  ✓ Leave the doors open for 30 minutes to allow air to flow.
  ✓ Clean the house.
  ✓ Throw in the latrines or bury dead mosquitoes or other insects, as well as dust.
  ✓ Wash hands with soap.
  ✓ Wait 6-9 months to paint the walls depending on the insecticides used.

  ✓ In case of allergy: itching skin, wash with soap and water

IRS MESSAGES CONVEYED BY IEC/BCC MOBILIZERS

–To the community:

- IRS is free.
- IRS protects the family and the entire region.
- IRS reduces mortality of pregnant women and children under 5 years.
- IRS protects the house for 3 to 6 months.
- IRS is safe for people and pets if all conditions are met.
- IRS is very effective if all structures are sprayed.
- IRS is funded by the American people

Messages to SOPs:

- Facilitate the process by working with the community.
- Wear personal protective equipment (PPE).
- Ensure the effectiveness and quality of spraying.
- Do not cover the walls after spraying and for at least 6 months.

ANNEX G1: ENVIRONMENTAL MITIGATION AND

Please find table on the following page.

Category of Activity	Describe specific environmental threats of your organization's activities	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring

Category of Activity	Describe specific environmental threats of your organization's activities	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring
Use of insecticides	1. Occupational risks for workers involved in IRS campaigns (e.g., risks from insecticide exposure and vehicular accidents), especially women of child-bearing age	a. Inspect and certify vehicles used for pesticide or spray team transport prior to contract. b. Train drivers c. Provide cell phone, personal protective equipment (PPE) and spill kits during pesticide transportation. d. Initial and 30-day pregnancy testing for female candidates for jobs with potential pesticide contact. e. Health test all spray team members for duty fitness. f. Procure, distribute, and train all workers with potential pesticide contact on the use of PPE. g. Train operators on mixing pesticides and the proper use and maintenance of spray pumps. h. Provide adequate facilities and supplies for end-of-day cleanup. i. Enforce spray and clean-up procedures.	a-d. Environmental Compliance Officer (ECO). e-g. Operations Manager (OM). h. ECO i. Chief of Party (COP), Technical Project Managers (TPM) and headquarters environmental staff.	a. Transport vehicles have a valid inspection certificate on-board. b. Drivers have a certificate of training completion. c. Transport vehicles are equipped with cell phone, spill kit, and PPE. d. Storekeeper has records of pregnancy testing for all female team members. e. Storekeeper has medical exam results for all team members. f. Spray operators wear complete PPE during spraying and clean-up. g. Operators mix pesticide properly, and the pump does not leak. h. All facilities are compliant, and materials required for clean-up are present. i. Inspections are performed as scheduled, corrective action is taken as needed.	a-c. ECO inspection of vehicles in the field. d-e. ECO inspection of health records at IRS operational sites. f-h. ECO performs pre-spray inspections of inventories and training records, and mid-spray inspections of PPE use and spray operator performance. i. Monitoring of on-line database for submission of inspection reports.	a-c. 2 inspections per week. d-e. One inspection per campaign, additional inspection if new hires or more than 30 spray days. f-h. ECO pre-spray inspections 2/campaign, ECO mid-spray inspections 5 times/week. i.Weekly

Category of Activity	Describe specific environmental threats of your organization's activities	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring
	2. Safety risks for residents of sprayed houses (e.g., risks from inhalation and ingestion of insecticides)	a. IEC campaigns to inform homeowners of responsibilities and precautions. b. Prohibit spraying houses that are not properly prepared. c. Two-hour exclusion from house after spraying d. Instruct homeowners to wash itchy skin and go to health clinic if symptoms do not subside.	a-b. IEC officers, OM, ECO c. ECO d. Spray operators (SO) and Team Leaders (TL)	a. Pre-spray IEC campaigns were executed. Homeowners know responsibilities. b. All houses being sprayed are properly prepared. c. Homeowners observe 2 hour exclusion. d. Lack of incident reports, or incident reports with proper response noted.	a. OM- IEC work records, ECO- mid-spray inspections. b-d. ECO mid-spray inspections	a. Inspect work records 1/campaign, b-d. ECO mid-spray inspections 3/wk.
	3. Ecological risk to non-target species and water bodies from use of insecticides (during mixing and spraying)	a. Spray indoors only. b. Train operators on proper spray technique. c. Maintain pumps.	a-c. TL, District Coordinator (DC), OM, ECO	a. Operators spray only inside of houses. b. Operators are trained and know and use proper spray techniques. c. Pumps are maintained and operated to eliminate leaks and erratic spraying.	a. ECO mid-spray inspections. b-c. Training records, ECO mid-spray inspections	a. ECO inspections 3/wk. b. ECO inspection of training records 1/campaign. b-c. ECO mid-spray inspections 5/wk.

Category of Activity	Describe specific environmental threats of your organization's activities	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring
	4. Environmental risk from disposal of insecticide (both liquid and solid waste)	a. Choose sites for disposal of liquid wastes, including mobile soak pit sites according to PMI BMPs. b. Construct fixed and mobile soak pits with charcoal to adsorb pesticide from rinse water. c. Maintain fixed and mobile soak pits as necessary during season. d. Inspect and certify solid waste disposal sites before spray campaign. e. Monitor waste storage and management during campaign. f. Monitor disposal procedures post-campaign.	a-c. Abt OM, ECO, DC d-f. Abt ECO	a. Operations sites meet PMI BMPs. b. Fixed and mobile soak pits are sited and constructed according to the PMI BMP manual. c. Fixed and mobile soak pits perform properly throughout the spray season. d. Disposal sites have the capacity and policies to properly dispose of wastes. e. Solid wastes are stored and managed according to PMI BMPs. f. Waste disposal has taken place as agreed and certificates of disposal received.	a-b. ECO Pre-spray inspections c-f. ECO mid- and post-spray inspections and monitoring.	a.2/campaign b.1/campaign c. 5/week d. 1/campaign e. 3/week f. Continuous during disposal
	5. Risk of diversion of insecticides for unintended or uncontrolled use	a. Maintain records of all pesticide receipts, issuance, and return of empty sachets/bottles. b. Reconcile number of houses sprayed vs. number of sachets/bottles used. c. Examine houses sprayed to confirm spray application. d. Perform physical inventory counts during the spray season.	a-d. Storekeepers, District coordinators, sector managers, logistics coordinator, OM, ECO	a-d. All pesticide management records are reconciled.	a-b, d. Inspection of pesticide management records. Storekeeper performance checklists. c. ECO mid-spray inspections.	a-b, d. Daily monitoring by storekeeper or site supervisor. Weekly monitoring by District Coordinators c. 1/campaign by country headquarters. 2/campaign by ECO d. 2/campaign/ store-room

ANNEX G 2 : ENVIRONMENTAL MITIGATION AND MONITORING REPORT

Environmental Mitigation and Monitoring Report Madagascar 2016			
Mitigation Measure	Status of Mitigation Measures	Outstanding issues relating to required conditions	Remarks
1a. Pre-contract inspection and certification of vehicles used for pesticide or spray team transport.	Pre-contract inspection and certification of vehicles was conducted on the 18th to 22nd of July, 2016 for the South East and from the 29th of August, 2016 for the East		For the South East, AIRS Madagascar contracted 14 vehicles and 13 vehicles for the East.
1b. Driver training	Driver training was conducted on July 18 in the South East and August 29 in the East. 27 drivers were trained for the 2016 spray campaign in 5 districts.		
1c. Cell phone, personal protective equipment (PPE) and spill kits on board during pesticide transportation.	All drivers had cell phones as a pre-requisite for hiring and were provided with PPE and spill kits after being trained. IRS Madagascar conducted 20 supervisions for the morning mobilization vehicle inspection. For 19 of these inspections, the vehicles had the complete kit.		For the only time that the spill kit was missing, the reason was: the spray operators needed to go far away from the vehicle to spray and they took the spill kit along.
1d. Initial and 30-day pregnancy testing for female candidates for jobs with potential pesticide contact.	Initial pregnancy tests were conducted before hiring Spray Operators, Washers and Store Assistants from July 18 to August 6, 2016 for the South East and from August 26 to September 3, 2016 for the East		
1e. Health fitness testing for all operators	Medical examinations were conducted for potential candidates as one of the benchmarks for selection of Spray Operators from July 18 to July 23, 2016 for the South East and from August 29 to September 3, 2016 for the East across the targeted IRS districts.		

1f. Procurement of, distribution to, and training on the use of PPE for all workers with potential pesticide contact.	Both International and local procurement were carried out successfully prior to all trainings.		
1g. Training on mixing pesticides and the proper use and maintenance of spray pumps.	The correct mixing procedure for pesticides, including triple rinse of the bottles, was included in all trainings. The Supervisors were trained together with the Team Leader as pump mechanics for the maintenance of the pumps.		227 Team Leaders (91 in the South East, 136 in East Coast) and 1,136 Spray Operators (455 in the South East and 681 in East Coast) were trained. Team Leaders were also trained in the maintenance of spray pumps.
1h. Provision of adequate facilities and supplies for end-of-day cleanup,	Most of the storage facilities were donated to the project by the District Assemblies of the various districts. However, the end-of-day cleanup was solely the responsibility of the site managers and supported by the field supervisors at each operations site. AIRS Madagascar conducted 88 supervisions for the end of day cleanup.		
1i. Enforce clean-up procedures.	The clean-up procedure for the pumps was done in the designated wash areas and supervised by the site managers.		
2a. IEC campaigns to inform homeowners of responsibilities and precautions.	AIRS Madagascar conducted sensitization campaigns and information before spraying. IEC materials were distributed among households.		275,950 flyers, 8,880 posters, 3,054 T-shirts, 3,063 caps, and 96 banners were distributed.
2b. Prohibition of spraying houses that are not properly prepared.	178 supervisions were made and found 6 cases where the resident was not informed of spraying protocol and was not well prepared so that the structure was sprayed.		
2c. Two-hour exclusion from house after spraying			

2d. Instruct homeowners to wash itchy skin and go to health clinic if symptoms do not subside.			
3a. Indoor spraying only.	AIRS Madagascar conducted 178 supervisions regarding the homeowner preparation and spray operator performance.		
3b. Training on proper spray technique	Team Leader and Spray Operator training was conducted in the South East from July 18 to July 23, 2016 and from August 29 to September 3, 2016 in the East.		
3c. Maintenance of pumps	17 cases of leaking pumps were observed during the 178 supervision inspections.		The SOPs were immediately instructed to stop spraying and contact the Team Leader for the repair or replacement of the pump.
4a. Choose sites for disposal of liquid wastes , including mobile soak pit sites according to PMI BMPs.	The selection of sites was done by the ECO and supervised by the COP according to the PMI BMP. 3 rounds of Pre-Season Environmental Compliance Assessment were conducted. For the South East 47 PSECAs were conducted (from May 20 to September 2, 2016) and for the East 47 PSECAs (from June 14 to September 9).		Some sites were not ready before the start of the campaign
4b. Construct fixed and mobile soak pits with charcoal to adsorb pesticide from rinse water.	All the soak pits were constructed as per directions in the BMP. During the PSECA, the ECO supervised the construction of all new soak pits. When the sprayers use the mobile soak pit, the sector manager informs the ECO or his assistant who will supervise the place of installation and use. Otherwise, written instructions were given to the team leaders to select installation locations and methods of use according to BMP		AIRS Madagascar built 52 new soak pits (21 in the South East and 31 in the East). 107 mobiles soak pit were built (49 for South East and 58 for East)

4c. Maintain soak pits as necessary during season.	All soak pits were cleared of vegetation and serve as a filter during the spray campaigns. These soak pits were functional during the campaign and did not require any repairs.		
4d. Inspection and certification of solid waste disposal sites before spray campaign.	All solid waste generated will be incinerated at a waste management and recycling company, Adonis Madagascar.		
4e. Monitoring waste storage and management during campaign.	134 inspections regarding storekeeper performance were conducted.		
4f. Monitoring disposal procedures post-campaign.	The ECO will monitor the post-spray campaign solid waste procedure and disposal from the district level to the central warehouse and to the final designation for proper disposal at Adonis from January 2017.		
5a. Maintain records of all pesticide receipts, issuance, and return of empty sachets/bottles.	Records of all pesticide receipts from central stores, issuances and returns of empties were kept on the stock cards with backups in ledger books at regional and district level, as well as the sub-districts warehouses. 134 controls were made regarding the documents of stock.		
5b. Reconciliation of number of houses sprayed vs. number of sachets/bottles used.	On average, one bottle is needed to spray 6.18 houses. It is higher compared to the target: 5.8 houses / bottles.		In the South East: 7.14 houses were sprayed per bottle and in the East 5.23 houses were sprayed per bottle.
5c. Visual examination of houses sprayed to confirm pesticide application.	Visual examination of houses sprayed was conducted by observing the traces of the sprayed chemical of the walls, ceilings, and eaves. IRS technical staff and government supervisors conducted 178 examinations.		

5d. Perform physical inventory counts during the spray season.	The ECO and Logistics ensured physical inventory taking during and after the spray season. 134 inspections were made.		

ANNEX H: REASONS FOR NON-SPRAY, 2014 & 2015 & 2016

TABLE 22: REASONS FOR NON-SPRAY, 2014 (5.4%) & 2015 (8.5%) & 2016 (4.1%) OF ALL ELIGIBLE STRUCTURES FOUND

In each district of the East Coast region and in Farafangana, refusals have decreased this year.

	Reason for non-spray																				
	Closed Structure			Refusal			Sickness			Family Event			Insecticide Smell[1]			Other			Total		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
BRICKAVILLE	1,398	598	386	1,054	923	422	299	1,074	765	30	167	104	-	-	339	240	670	159	3,021	3,432	2,175
	3.1%	*1.2%*	*0.7%*	*2.3%*	*1.9%*	*0.7%*	*0.7%*	*2.2%*	*1.3%*	*0.1%*	*0.3%*	*0.2%*			*0.6%*	*0.5%*	*1.4%*	*0.3%*	*6.7%*	*7.0%*	*3.8%*
FENERIVE EST	1,279	2,023	683	950	1,687	639	537	2,088	1,464	30	594	249	-	-	1,239	579	885	-	3,375	7,277	4,274
	1.9%	*2.3%*	*0.6%*	*1.4%*	*1.9%*	*0.6%*	*0.8%*	*2.4%*	*1.4%*	*0.0%*	*0.7%*	*0.2%*			*1.2%*	*0.9%*	*1.0%*	*0.0%*	*5.0%*	*8.2%*	*4.0%*
TAMATAVE II	997	1,317	489	868	2,237	633	290	980	1,049	28	644	146	-	-	773	316	167	149	2,499	5,345	3,239
	2.0%	*2.2%*	*0.7%*	*1.8%*	*3.7%*	*0.9%*	*0.6%*	*1.6%*	*1.5%*	*0.1%*	*1.1%*	*0.2%*			*1.1%*	*0.6%*	*0.3%*	*0.2%*	*5.1%*	*8.8%*	*4.6%*
TOTAL EAST COAST	3,674	3,938	1,558	2,872	4,847	1,694	1,126	4,142	3,278	88	1,405	499	-	-	2,351	1,135	1,722	308	8,895	16,054	9,688
	2.3%	*2.0%*	*0.7%*	*1.8%*	*2.4%*	*0.8%*	*0.7%*	*2.1%*	*1.6%*	*0.1%*	*0.7%*	*0.2%*			*1.1%*	*0.7%*	*0.9%*	*0.1%*	*5.5%*	*8.1%*	*4.6%*
FARAFANGANA	-	1,533	366		5,320	874		1,310	1,471		665	373	-	-	1,828		1,527	-		10,355	4,912
		1.1%	*0.4%*		*3.9%*	*0.9%*		*0.9%*	*1.5%*		*0.5%*	*0.4%*			*2.1%*		*1.1%*	*0.0%*		*7.5%*	*5.0%*
VOHIPENO			1,555			1,801			984			1,205			737			580			6,862

			3.2%			***3.7%***			***2.0%***			***2.5%***			***1.5%***			***1.2%***			***14.0%***
TOTAL SOUTH EAST	-	1,533	1,921	-	5,320	2,675	-	1,310	2,455	-	665	1,578	-	-	2,565	-	1,527	580	-	10,355	11,774
		1.2%	***1.3%***		***4.0%***	***1.9%***		***1.0%***	***1.7%***		***0.5%***	***1.1%***			***1.8%***		***1.2%***	***0.4%***		***7.8%***	***8.2%***

[1] New category added to the 2016 data collection forms.