



PRESIDENT'S MALARIA INITIATIVE



PMI | Africa IRS (AIRS) Project
Indoor Residual Spraying (IRS 2) Task Order Six

SENEGAL
END OF SPRAY REPORT 2015

SUBMITTED: JULY 28, 2015

Recommended Citation: PMI | Africa IRS (AIRS) Project Indoor Residual Spraying (IRS 2) Task Order Six. July 2015, 2015 End of Spray Report. Bethesda, MD. PMI | Africa IRS (AIRS) Project Indoor Residual Spraying (IRS 2) Task Order Six, Abt Associates Inc.

Contract No.: GHN-I-00-09-00013-00

Task Order: AID-OAA-TO-I4-00035

Submitted to: United States Agency for International Development/PMI

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ACRONYMS

AIRS	Africa Indoor Residual Spraying
BREIPS	<i>Bureau Régional de l'Éducation et de l'Information pour la Santé</i> (Regional office of Health Education and Information)
DC	District Coordinator
DCV	Data Collection Verification
DEC	Data Entry Clerk
DEEC	<i>Direction de L'environnement et des Etablissements Classés</i> (Directorate for the Environment and Classified Factories)
DHMT	District Health Management Team
DMO	District Medical Officer
DPM	<i>Divison de la Prévention Médicale</i> (Medical Prevention Division)
DPV	<i>Direction de la Protection des Végétaux</i> (Directorate for Plant Protection)
DREEC	<i>Direction Régionale de l'Environnement et des Etablissements Classés</i> (Regional Branch of the Directorate for the Environment and Classified Factories)
EC	Environmental Compliance
ECO	Environmental Compliance Officer
HPN	Health Post Nurse
IEC	Information, Education, and Communication
IRS	Indoor Residual Spraying
M&E	Monitoring and Evaluation
MOH	Ministry of Health
MSP	Mobile Soak Pit
NMCP	National Malaria Control Program
PMI	President's Malaria Initiative
PPE	Personal Protective Equipment
SNEIPS	<i>Service National de l'Éducation et l'Information pour la Santé</i> (National Health Education and Information Service)
SNH	<i>Service National de l'Hygiène</i> (National Hygiene Service)
SOP	Spray Operator
UCAD	<i>Université Cheikh Anta Diop de Dakar</i>
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

In 2015, AIRS Senegal conducted spray operations in the four target districts of Malem Hoddar, Kougheul, Koumpentoum, and Nioro through the PMI AIRS Project funded by the President's Malaria Initiative (PMI) and the United States Agency for International Development (USAID).

As part of an ongoing transition process, AIRS Senegal worked with the National Malaria Control Program (NMCP) through an integrated team where AIRS Senegal coached Ministry of Health (MOH) counterparts during the implementation of the IRS campaign in the four target districts.

The objective of this ongoing transition process is to increase the local government's level of responsibility and ownership of indoor residual spraying (IRS). For this purpose, NMCP conducted Information, Education, and Communication (IEC) mobilization activities in all four target districts with direct funding from PMI while AIRS Senegal provided complementing technical assistance.

In 2015, Senegal's IRS Steering Committee decided to spray "hot spot" health posts – defined epidemiologically as health post zones with malaria incidence in excess of 15 cases per 1,000 residents – within the four target districts (i.e. Malem Hoddar, Kougheul, Koumpentoum, and Nioro). In total, Senegal's IRS Steering Committee identified 51 "hot spot" health posts in these districts using HMIS data on malaria incidence, which was confirmed by a data verification survey against reported cases in health facilities' case books. One round of spray operations was conducted in malaria "hot spot" health posts.

AIRS Senegal worked in close collaboration with NMCP in the four target districts and was responsible for conducting Monitoring and Evaluation (M&E) and environmental inspections in collaboration with the Directorate for the Environment and Classified Factories (DEEC) and its regional branch (DREEC). AIRS Senegal was also responsible for identifying operations sites, procuring insecticide and personal protective equipment, managing warehouses, and training seasonal staff to spray homes and follow environmental safety and health guidelines.

As for supervision of spray operations, AIRS Senegal worked very closely with NMCP, DHMT, and National Hygiene Services (SNH) in all four target districts.

In 2015, AIRS Senegal sprayed 97.7% percent of the total targeted structures in the four target districts using an organophosphate insecticide, pirimiphos-methyl (Actellic 300 CS) and the remaining carbamates in an additional eight health posts in Nioro. AIRS Senegal conducted spraying over twenty operational days in three districts (Nioro, Koumpentoum and Kougheul) from May 22 to June 14, 2015, over eleven operational days in Malem Hoddar from May 22 to June 14, 2015, and over ten operational days in Nioro district from September 5 to September 14, 2015.

Table I shows the results of the 2015 spray campaign.

TABLE I. SUMMARY OF 2015 IRS CAMPAIGN

Indicator	Results
Number of districts covered by the PMI-supported IRS campaign	Four districts: Koumpentoum, Kounghoul, Malem Hoddar, and Nioro
Insecticide used	Organophosphates: 32,925 bottles Carbamates: 6,279 sachets
Number of structures sprayed by spray operators	130,170
Number of structures found by spray operators	133,252
2015 IRS campaign spray coverage	97.7%
Population protected by 2015 IRS campaign	514,833
Number of people trained to deliver IRS with US Government funds ¹	893
Total number of people trained with US Government funds ²	1,287

For the 2015 spray campaign, AIRS Senegal used a total of 32,925 bottles of organophosphates and 6,279 sachets of carbamates with an average of 3.4 structures sprayed per bottle and 3.0 structures per sachet.

In 2015, AIRS Senegal continued to use the Dimagi-based SMS platform to collect and disseminate spray campaign data on a daily basis to PMI and local stakeholders. The project also continued to use the smartphone application for delivering standardized supervision throughout the campaign, thereby improving the overall quality of the spray campaign. Six mobile soak pits were used in three sites. (See Sections 8 and 9 for more information.)

¹ Total number of personnel trained in IRS implementation using AIRS Project resources.; this figure includes only spray personnel such as spray operators, team leaders, site manager, supervisors, and clinicians.

² Total number of people trained using AIRS Project resources to implement/support elements of IRS in target districts

RESUME ANALYTIQUE

En 2015, les opérations d'aspersion ont été mises en œuvre dans les quatre (4) districts que sont Malem Hoddar, Koungheul, Koumpentoum et Nioro par le Projet PMI AIRS sous financement de l'USAID et de l'Initiative du Président des États-Unis pour la lutte contre le paludisme (PMI).

Dans le cadre du processus de transition, PMI AIRS Sénégal a travaillé avec le Programme National de Lutte contre le Paludisme (PNLP) à travers une équipe intégrée dans laquelle PMI AIRS Sénégal a coaché ses homologues du Ministère de la Santé et de l'Action Sociale (MSAS) durant la campagne AID 2015 dans les 4 districts.

Le but de ce processus de dévolution est d'accroître le niveau de responsabilité et d'appropriation des AID par les autorités gouvernementales. A cet effet, le PNLN a conduit le volet IEC dans l'ensemble des 4 districts cibles, avec un financement direct du PMI et l'assistance technique du Projet AIRS Sénégal.

En 2015, le comité de pilotage des AID au Sénégal a décidé d'adopter la stratégie des « hots spots », en ciblant les « points chauds » dans les 4 districts cibles (c'est-à-dire, Malem Hoddar, Koungheul, Koumpentoum et Nioro). Au total 51 postes de santé dans les districts ont été choisis par le comité de pilotage en se basant sur les données d'incidence palustre du système d'information sanitaire du Ministère de la santé et confirmées par une vérification sur site. Le critère principal a été d'avoir une incidence palustre de plus 15 cas pour 1000 habitants.

Le Projet PMI AIRS Sénégal a travaillé dans les quatre districts en étroite collaboration avec le PNLN, et était responsable de la mise en œuvre des opérations d'aspersion et du Suivi-Evaluation de la gestion de la conformité environnementale, en collaboration avec le DEEC à travers ses DREECs concernées.

En plus de la mise en œuvre de ces volets, le Projet PMI AIRS Sénégal était aussi responsable de l'identification des sites opérationnels, de l'achat de l'insecticide et des équipements, la gestion des entrepôts, la formation du personnel saisonnier pour le traitement des concessions et le respect des normes environnementales et de sécurité.

En ce qui concerne la supervision des opérations, PMI AIRS Sénégal a travaillé en étroite collaboration avec le PNLN, les équipes-cadres de districts, et le Service National de l'Hygiène (SNH) dans l'ensemble des quatre districts.

En 2015, 97.7% des structures trouvées ont été traitées par le Projet AIRS dans les quatre (4) districts avec l'insecticide organophosphoré pirimiphos-méthyl (Actellic 300 CS) et le restant de carbamates (Ficam) dans le district de Nioro.

PMI AIRS a mis en œuvre l'aspersion du 22 Mai au 14 Juin 2015 dans tous les districts et du 5 au 14 Septembre 2015 pour la seconde campagne à Nioro avec le Ficam.

Le Tableau I ci-dessous représente les résultats de la campagne d'aspersion 2015 qui a été mise en œuvre sur une durée globale de vingt jours opérationnels par district du 22 mai au 14 juin 2015 dans les trois districts (Nioro, Koumpentoum et Koungheul), onze jours opérationnels à Malem Hoddar et dix jours opérationnels à Nioro en Septembre 2015.

TABLEAU I. RESUME DE LA CAMPAGNE AID 2015

Indicateur	Résultats
Nombre de districts couverts par le projet AID appuyé par le PMI	4 districts: Koumpentoum, Kougheul, Malem Hoddar, et Nioro
Insecticides utilisés	Organophosphorés: 32,925 Carbamates: 6,279 sachets
Nombre de structures traitées par les opérateurs	130,170
Nombre de structures trouvées par les opérateurs	133,252
Couverture de la campagne AID 2015	97.7%
Population protégée par la campagne AID 2015	514,833
Nombre de personnes formées avec le fonds du Gouvernement US pour fournir Les services AID	893
Effectif total des personnes formées avec les fonds du Gouvernement US	1,287

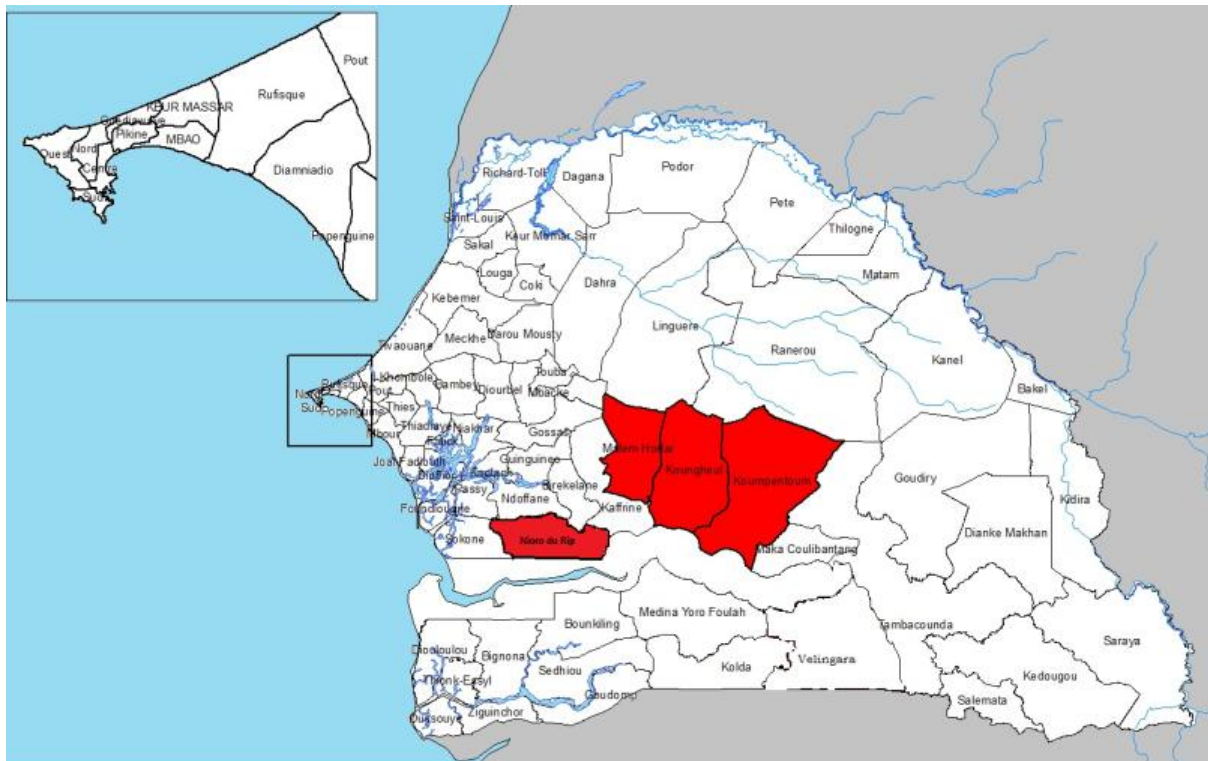
Pour cette campagne 2015, le projet PMI AIRS a utilisé au total 32,925 de flacons d'organophosphorés et 6,279 sachets de carbamates, avec en moyenne de 3.4 structures traitées par bouteilles et 3.0 structures traitées par sachet.

PMI AIRS Sénégal a mis en œuvre une plateforme de SMS pour collecter et partager les données de la campagne d'aspersion avec PMI et les partenaires locaux de façon quotidienne. L'équipe a aussi utilisé une application de smartphone/téléphone intelligente pour conduire une supervision standardisée tout le long de la campagne améliorant ainsi la qualité de la campagne dans son ensemble. Enfin PMI AIRS a continué l'utilisation des puisards mobiles dans trois sites (voir section 8 et 9 pour plus d'information sur ces études pilotes)

I. COUNTRY BACKGROUND

In 2015, the NMCP in collaboration with PMI Senegal and Senegal’s IRS Steering Committee decided to continue IRS operations in Koumpentoum, Koungeul, Malem Hoddar, and Nioro, four of the 16 priority districts with high malaria morbidity as shown in Figure 1. However, in 2015 Senegal’s IRS Steering Committee decided to spray “hot spot” health posts within the four districts using a focal spraying strategy. As shown in Figure 2, 51 health posts in these districts were selected for IRS.

FIGURE 1. MAP OF SENEGAL PMI IRS DISTRICTS



 Districts AID

2.OBJECTIVES FOR 2015 IRS CAMPAIGN

In 2015, the main objective for PMI AIRS Project in Senegal was to continue working with the Ministry of Health and Social Welfare, NMCP, PMI, and other stakeholders to achieve at least 85 percent spray coverage in the IRS target districts.

As in previous years, AIRS Senegal worked as an integrated team with the NMCP throughout the planning and implementation of the IRS campaign in the four districts. AIRS Senegal was responsible for M&E and environmental compliance (EC) inspections in collaboration with the DEEC and its regional offices (DREEC) covering the four target districts. AIRS Senegal also conducted the distribution and transportation of IRS commodities and personnel. In coordination with NMCP and SNH, AIRS Senegal organized training and supervision of operations in all four districts with SNH playing a key role. NMCP conducted IEC mobilization activities in all four districts with direct funding from PMI/Senegal.

2015's spray campaign used two insecticide types: 1) an organophosphate, pirimiphos-methyl (Actellic 300 CS) in Malem Hoddar, Kounghoul, Koumpentoum, and Nioro districts and 2) the remaining sachets of carbamate insecticide in an additional eight health posts in Nioro district in September 2015. In 2015, the project was expected to carry out the following activities:

- Support training, capacity-building, and advocacy at the national, regional, and district levels as a means of achieving IRS sustainability. This included building the capacity of the government, counterparts, and partners to lead a high-quality IRS campaign;
- Provide regular M&E support for the IRS program;
- Carry out logistical assessments as needed and arrange all procurement, shipping, delivery, and storage of sprayers, spare parts, insecticides, and personal protective equipment (PPE);
- Ensure safe and correct insecticide application, thus minimizing human and environmental exposure to IRS insecticides in compliance with the Supplemental Environmental Assessment amendment;
- Support NMCP and other local partners with coordination of IEC, sensitization, and mobilization activities to raise awareness and encourage acceptance of IRS;
- Assist NMCP in smoothly transitioning selected IRS responsibilities to districts, including development of communication plans, recruitment of spray personnel, development of district IRS micro-plans, development of training materials, supervision of IRS activities, and EC;
- Continue data collection and reporting via SMS for team leaders, the use of smartphones for IRS supervision in four districts, and the use of mobile soak pits at three operational IRS sites;
- Promote cost efficiency through due diligence and efficiency of operations; and
- Spray at least 85% of a target of 133,252 structures in the four districts, protecting a target of 523,962 residents.

3. PREPARATION FOR IRS CAMPAIGN

3.1 IRS CAMPAIGN PLANNING

Following the recommendations made by District Medical Officers (DMOs) during the 2014 evaluation meeting, IRS activities were incorporated into the four district health annual action plans for 2015.

In collaboration with NMCP and prior to the work planning exercise, from February 24-27, 2015 AIRS Senegal conducted a training session on strengthening the regional and district capacity in IRS implementation. The participants included SNH, DEEC, *Service National de l'Education et l'Information pour la Santé*/National Health Education and Information Service (SNEIPS), district IRS focal persons, and medical officers in the four districts. Facilitators (AIRS, SNH) presented all components of the IRS program including planning, EC, M&E, IEC, procurement and logistics training, and supervision. The discussions were in the context of the transition to MOH taking into consideration the magnitude of IRS activities and the limitation of human resources and timing that a campaign requires.

Under the NMCP's leadership, AIRS Senegal, SNH, *Université Cheikh Anta Diop de Dakar* (UCAD), and Senegal's IRS Steering Committee members participated in the National IRS Planning Workshop from March 4-5, 2015. The objectives of the workshop were to share and validate 2015's IRS implementation plan and to include IRS activities in the annual health action plans for each PMI-supported district. At this meeting, participants validated the IEC/IRS communication plan developed by NMCP with AIRS Senegal's technical assistance. NMCP's director presented focal spraying targeting 'hot spots' in the four districts. Participants included members of the IRS Steering Committee, regional and district health managers, local political authorities, national and regional SNH managers, and SNEIPS. The overall result of this workshop was that AIRS Senegal built a consensus on the IRS activities to be implemented during the 2015 IRS campaign in the four target districts based on the new focal spraying strategy.

Table 2 lists the activities AIRS Senegal led or participated in to plan and organize the 2015 IRS campaign.

TABLE 2. 2015 IRS PLANNING AND ORGANIZATION

Areas	Activities implemented
AIRS staff orientation	<ul style="list-style-type: none"> • M&E workshop in Ghana for M&E manager and the data manager (June 2015) • Training on entomology in Ghana for the TM and NMCP entomologist (July 2015) • Gender training in Rwanda for PMI AIRS gender focal point (March 2015)
IRS activities planning	<ul style="list-style-type: none"> • National-level planning (March 2015) • District-level planning (micro-planning), and development spray calendar (April 2015) • Nioro district micro-planning for spraying remaining carbamates (September 2015)
Recruitment of seasonal personnel	<ul style="list-style-type: none"> • PMI AIRS temporary personnel: finance assistants, logistics assistants, data entry clerks • PMI AIRS site seasonal personnel: site managers, team leaders, spray operators • Auxiliary staff: drivers, storekeepers, repair technicians, washers, water suppliers
Personnel capacity-building	<ul style="list-style-type: none"> • Review of spray operator training guide • Review of existing training manuals and tools • Training of NMCP regional and district staff including; BRH SNH, DEEC, SNEIPS • Training of AIRS district staff including, finance assistants, logistics assistants, data entry clerks • Training of new SNH agents in three regions covering IRS (Kaffrine, Kaolack, Tambacounda) • Country-level IRS training of trainers and DREEC • PMI AIRS staff gender training • Physicians' and nurses' training on IRS-related poisoning case management
Environment	<ul style="list-style-type: none"> • Closure of non-hot spots sites • Management of obsolete waste: plastic, electronic and scrap metal • Identification and selection of operational facilities at district and secondary sites • Implementation of mobile soak pit • Pre-inspection and validation for all IRS sites using smartphones • SEA development and submission to Home Office and USAID for IRS EC • Monitoring secondary IRS site rehabilitation and inspections using smartphones • Inspect and issue certificates to all transport vehicles prior to signing of a renting contract • Training on environmental management of IRS campaign
M&E	<ul style="list-style-type: none"> • Updating of IRS data collection tools and mobilization data collection tools • Reviewing of IRS database and mobilization database • Recruitment of data clerks for IRS and IEC mobilization data entry • Implementation of SMS for collecting and sending data • Developing an evaluation tools for hot spots assessment
Operations	<ul style="list-style-type: none"> • Finding secondary sites and camping site • Deployment of Abt district personnel (finance assistants, logistics assistants, data entry clerks) • Micro planning workshops in the four districts • Validation of spray calendars and communication plans • Building and rehabilitation of IRS sites in compliance with environmental standards • Production of training manuals and data collection tools • PMI AIRS staff gender training • Recruitment of seasonal personnel • Seasonal personnel's pre-IRS medical examination • Training of spray operators and auxiliary staff (drivers, storekeepers, repair technicians, washers) • Development of supervision plan for spray operations • Implementation of supervision tools • Coordination and monitoring of spray operations • Implementation of smartphone for supervision • Monitoring of spray performance tracking sheet
Logistics	<ul style="list-style-type: none"> • Physical inventory of existing equipment • Quantification of insecticide and IRS equipment • Equipment check to determine cleaning and repair needs

Areas	Activities implemented
	<ul style="list-style-type: none"> • Needs assessment for local and international procurement • Transportation needs assessment • Training of logistics assistants and storekeepers • Dispatching and delivery of materials from the central warehouse to districts and secondary sites • Management of contaminated solid wastes
Communication	<ul style="list-style-type: none"> • Technical assistance to NMCP in reviewing the IEC plan, reviewing and developing IEC materials, IEC material production and distribution, and validating districts IEC plans • Participation in IEC activities supervision including the supervision of HPN's orientation and IEC mobilizers and supervisors training • Participation in the various NMCP/IEC committee meetings
Partnership	<ul style="list-style-type: none"> • Monthly tripartite meeting with NMCP coordinator, PMI team, and Abt COP • Weekly meeting between PMI AIRS Operation Manager with NMCP and SNH focal persons • Initial contact visits with strategic IRS partners: NMCP, SNH, District Health Management Team (DHMT) local authorities, Laboratories of Vector and Parasite Ecology, and Directorate of SOCO CIM Cement Factory, Sodiaplast (recycling firm) • Empowering regional environmental officers for IRS EC inspections • IEC IRS Strategy Committee mainly composed of NMCP, Service National de l'Education et l'Information pour la Santé (SNEIPS) focal persons, and PMI AIRS IEC coordinator • Partnership development with micro-finance institutions for timely and secured payment of SOPs
Administration & Finance, Procurement	<ul style="list-style-type: none"> • 2015 Budget preparation • IRS lease agreements—drafting and signing- moving to new office • Recruitment of seasonal personnel • IRS operations participants' agreements—drafting and signing • Vehicle rental announcement and selection • Vehicle lease agreement—drafting and signing

3.2 LOGISTICS PLANNING AND PROCUREMENT

3.2.1 INVENTORY

Based on the 2014 post-spray inventory data and decisions on the 2015 spray target areas, the logistics coordinator quantified the needs for the 2015 season and worked jointly with the procurement coordinator on local purchases of IRS supplies and materials.

During the spray campaign, logistics assistants conducted inventories every 15 days to secure appropriate stock in the districts. The team organized additional dispatches of materials to the secondary sites' storerooms every ten days or as frequently as needed. Besides the stocktaking conducted every 15 days, stock cards and records were completed twice a day by site storekeepers for more traceability, thus enabling the logistics coordinator to have a daily update of stock in store.

During the 2015 spray campaign, organophosphates stock use was subjected to rigorous monitoring. Seventy percent of the remaining bottles in stock (13,617 bottles) were scheduled to expire in May and June 2015. Samples (one bottle of each batch) of four batches were sent to CEM Analytical Services, Ltd. (CEMAS) in the United Kingdom for testing and recertification. All batches successfully passed the test, so expiration dates were extended through April 2016. In addition, AIRS Senegal developed stock cards for organophosphates inventory and stock disposal using first-expired, first-out (FEFO). Out of the remaining 7,412 sachets of carbamates, 6,279 were used in September 2015 in eight (8) selected health posts in Nioro.

At the end of the 2015 spray campaign, all materials and equipment were counted and adequately stored at district level and ultimately shipped to the central warehouse. For security purposes, all the insecticide was moved to the main warehouse in Kaolack.

3.2.2 SERVICING OF EQUIPMENT

For the 2015 spray campaign, PMI AIRS Senegal conducted refresher trainings of spray operators and pump repair technicians on the use of the Goizper pump that was introduced in 2014. Goizper Regional Director Omar Sanogo voluntarily assisted with the training of spray operators in maintenance (preventive and corrective) of Goizper pumps. Goizper pumps were satisfactorily used in Koumpentoum and Nioro.

Hudson pumps were also subject to preventive maintenance before their use in Kounghoul, Malem Hoddar and Nioro (in September). According to WHO recommendations, AIRS Senegal received 750 CFVs for the Hudson pumps to ensure a consistent quality of spraying.

All spray operators in Kounghoul, Malem Hoddar, and Nioro's second campaign using Hudson pumps were trained on the importance of using CFVs and they all used them under the control of local supervisor.

In addition, the project serviced and deployed fire extinguishers and generators to all four districts prior to the start of the 2015 campaign.

3.2.3 PROCUREMENT

To estimate correct quantities of insecticide, IRS equipment, and other supplies required for the 2015 campaign, AIRS Senegal used data that was based on the structures found after the 2014 campaign. Specifically, 2015's organophosphate order was based on a 3.2 ratio of bottle used per structure, which was calculated from the 2014 spray campaign performance data. Using 2014 IRS structures made it possible to assess the exact number of spray needs for the 2015 campaign in a 20-day period, assuming that one spray operator sprays an average of 13 structures per day. A list of items procured internationally and locally to meet the needs of the 2015 spray round is included in Annex A.

3.2.4 DISPATCHING OF COMMODITIES

By April 25, 2015, local and international procurements were all available at the central warehouse in Kaolack. AIRS Senegal then developed a dispatching plan based on the distribution list that helped estimate the appropriate quantity of each item for each site. By April 27, 2015, all districts had received their IRS materials, twenty two (22) days prior to the start of the spray campaign.

During spray operations, AIRS Senegal's technical team members made supervision trips throughout the spray campaign to monitor stock management in the field storerooms. At the end of each trip, supervisors provided recommendations to the logistics assistants and storekeepers and coached them on addressing any identified shortcomings.

3.3 TRAINING

The AIRS Senegal team conducted jointly a series of trainings with the District Health Management Team (DHMT), Regional Office of Health Education and Information (BREIPS), and representatives from the NMCP for various spray personnel to prepare for the spray season as shown in Annex B. In total, AIRS Senegal funded the training of 893 people to deliver IRS, of whom 26% were female. The trainings and orientation sessions are described below.

From the total number of people trained for the 2015 Spray Campaign, AIRS Senegal hired 968 people, 30% of whom were female (See Table 6 in Section 5.1). The reason for the difference between the

number of people trained and the number of people hired is that the project works with numerous government supervisors who are trained by AIRS Senegal but not hired directly by the project.

In total, AIRS Senegal and NMCP trained 2,110 persons. This number includes 1,287 persons trained by AIRS Senegal (including 133 mobilizers for whom training was funded by PMI AIRS) and 823 IEC mobilizers trained by NMCP. Among this number, 865 were women representing 41%.

3.3.1 CAPACITY BUILDING FOR REGION AND DISTRICTS

The capacity building training of health agents from medical regions and districts included SNH, BRH, DEEC, *Bureau regional de l'Education et l'Information pour la Santé*/National Health Education, and Information Service (BREIPS), IRS focal points, and medical officers. The 2015, training took place from February 24 -27 in Kaolack in collaboration with NMCP. The NMCP coordinator chaired the workshop. He presented the objectives of the training and emphasized on the transition process of IRS activities to the government. Facilitators (AIRS, SNH) facilitated all components of IRS program including:

- Underlying principles of IRS;
- IRS implementation process;
- Environmental aspects;
- IRS supervision;
- M&E;
- IRS/IEC
- Financial and administrative procedures in IRS (USAID); and
- Roles and Responsibilities.

In total, AIRS Senegal trained 21 participants including five women.

3.3.2 ORIENTATION OF AIRS DISTRICT TEMPORARY PERSONNEL

After recruiting temporary district personnel (e.g. logistics and finance assistants), AIRS Senegal held an orientation workshop in April 2015 to build organizational and operational capacity of newly hired district staff, including logistics and finance assistants, to better execute their assignments at their respective job posts. In total, five temporary personnel were trained. The workshop topics included:

- Managerial aspects at district level;
- Abt's code of conduct;
- District-level activity timeline;
- EC measures;
- IRS/IEC;
- Logistics organization management;
- Operations' financial procedures;
- Data collection organization;
- Techniques for supervising spray operations; and
- Roles and responsibilities.

3.3.3 SMARTPHONE TRAINING FOR SNH STAFF

In order to ensure the use of smartphones for better supervision of IRS activities AIRS Senegal and Dimagi, Inc. worked on the smartphone-based supervision tool taking into consideration lessons learned and recommendations from the 2014 experiences. Next, Senegalese government staff were trained with support from AIRS Senegal and Dimagi. AIRS Senegal trained 55 SNH supervisors in all districts on smartphone use from May 4-6, 2015 and September 4 for Nioro's second campaign.

In Nioro's second campaign, four women hygiene agents acted as assistant supervisors and were trained on how to use the smartphone.

The training covered the following topics:

- Revising supervision checklists;
- Method of smartphone use;
- Supervision reporting; and
- Guidelines for smartphone inventory management.

3.3.4 TRAINING NEWLY POSTED SNH STAFF IN IRS DISTRICTS

In 2015, there was a light reorganization of SNH staff across the country and new personnel who had not previously worked on IRS were assigned to IRS regions/districts. This training took place in Kaolack from April 8-11, 2015 to build the capacity of SNH staff who would train spray operators and supervisors. In total, 23 SNH agents and one NMCP staff were trained on the following topics:

- Overall vector control methods, especially IRS, their indications, and their limits;
- The various steps for IRS implementation at district level;
- Spray techniques and safety issues related to insecticide use;
- EC safety; and
- Gender approach in IRS to improve women's participation.

3.3.5 TRAINERS' ORIENTATION

AIRS Senegal conducted a trainers' orientation for all districts from May 4-6, 2015 in Kaolack. The purpose of the orientation was to share and harmonize training methodologies to be used by SNH trainers for SOPs training as well as during supervision. In 2015, AIRS Senegal invited DREEC inspectors at the orientation session. AIRS Senegal designed a trainers' training manual highlighting spray operators' expected skills and the teaching methodology, including the following topics:

- Teaching methodologies and techniques;
- Household preparation for quality of spray,
- Guidelines for insecticide mixture;
- Guidelines for structure marking and zip ties;
- Using smartphone for supervision;
- Supervisory data collection tools and questionnaires;
- Spray performance tracking tools;
- EC and safety measures;

- MSP implementation; and
- Gender inclusive approach.

3.3.6 SPRAY OPERATOR TRAINING (SOT)

Depending on the dates of spray operations start-up in the four districts, SOT workshops took place on May 7–11, 2015 in Koumpentoum and Kounghoul and on May 13–17, 2015 in Nioro and Malem Hoddar. As a result, 539 sprayers, 27 site managers, 109 team leaders, and 91 substitute sprayers were trained. Among these 766 IRS trained operational personnel, 362 were new to IRS operations.

Note: The highest performing SOPs from previous campaigns were selected for Nioro’s second campaign. Also, Hudson pumps with CFVs were used with carbamates.

Training covered the following topics:

- Spray techniques and proper management of insecticide;
- Data collection methodology;
- Household preparation for quality of spray;
- Guidelines for insecticide mixture;
- Guidelines for structure marking and zip ties;
- Sensitization of beneficiaries on IRS-related safety measures;
- Environmental compliance;
- Roles and responsibilities; and
- Sexual harassment policy.

3.3.7 WASHERS, GUARDS AND DRIVERS TRAINING

In total, 58 washers, 42 guards, and 73 drivers were trained on the roles and responsibilities during an IRS campaign, code of conduct, and environmental safety.

3.3.8 TRAINING FOR SITE MANAGERS AND STOREKEEPERS

District coordinators trained site managers (27) and storekeepers (31) on the purpose and use of the Spray Performance Tracking Sheet (SPTS) on May 12, 2015 in Kounghoul and Koumpentoum and on May 18, 2015 in Nioro and Malem Hoddar.

3.3.9 ORIENTATION OF SITE MANAGERS, TEAM LEADERS

To improve field coordination, spray leaders (27 site managers, 109 team leaders) were trained on IRS management at the operational level on May 12 and May 18, 2015 in Koumpentoum and Kounghoul and Nioro and Malem Hoddar districts, respectively. Additional orientation was conducted September 3, 2015 in Nioro. The sessions covered the following topics:

- Procedures and code of conduct at site level;
- Roles and responsibilities of site managers and team leaders, and relationships with SNH supervisors;
- IRS supervision activities;
- Use of the error eliminator sheet; and

- New IRS guidelines for 2015 including chalk marking, use of zip ties on structures, triple rinsing of insecticide bottles, and use of CFVs

The trainings on installation and uninstallation techniques of mobile soak pits (MSPs) as well as on progressive rinsing were conducted on May 13 for Koumpentoum, on May 18 for Malem Hoddar, and on September 4, 2015 for Nioro's second campaign. Trainers included the ECO and SNH IRS focal person. As a result, two SNH local supervisors, five site managers, and seventeen team leaders were trained

3.3.10 TRAINING OF SITE MANAGERS AND TEAM LEADERS ON SMS AND SMARTPHONE USE

AIRS Senegal trained site managers, with support from Dimagi, Inc., on the use of cell phones to report operational data (e.g. number of SOPs, number of rooms found, number of sprayed rooms, and amount of insecticide used) via SMS on a daily basis. The one-day training sessions were conducted in Koumpentoum/Koungheul and Nioro/Malem Hoddar. Site managers were also trained on how to use smartphones to fill out supervisory checklists. The following topics were covered in this workshop:

- Supervision checklists;
- Technical tools for smartphone and mobile phone use; and
- Rules of procedure for smartphone and mobile phone fleet management.

3.3.11 HEALTH WORKERS' TRAINING ON INSECTICIDE POISONING MANAGEMENT

All DMOs were trained on IRS-related poisoning management on May 15 in Nioro and Koumpentoum, on May 19 in Koungheul, on May 23 in Malem Hoddar and on August 25, 2015 in Nioro. At the district level, 46 HPNs and midwives (27 males and 19 females) newly posted in IRS zones were trained by their respective DMOs.

4. IEC ACTIVITIES

Since 2014, IRS' IEC mobilization component has been the overall responsibility of NMCP. AIRS Senegal provides technical assistance including strategy development, development and production of IEC tools, validation of IEC communication plans, and supervision of IEC activities. AIRS Senegal's IEC objectives for the 2015 spray were to continue supporting NMCP and other local partners with coordination of IEC, sensitization, and mobilization activities to raise awareness and encourage acceptance of IRS.

4.1 PREPARATIONS

AIRS Senegal provided technical assistance to NMCP in the following areas:

- Review of national IEC policy and tools;
- Production of IEC tools on NMCP request;
- Validation of district IEC plans;
- HPNs' orientation for IEC mobilizers' training;
- Supervision of IEC mobilizers' training by HPNs;
- Supervision of IEC activities implementation and conduct of the mobilization; and
- Coordination and monitoring of mobilization data collection and reporting to the district health offices and the PMI AIRS office in Dakar.

4.2 HEALTH POST NURSES' ORIENTATION FOR MOBILIZATION

The DHMT, under the supervision of NMCP, SNEIPS, and PMI AIRS IEC coordinator, facilitated orientation sessions for 51 health post nurses (HPNs) in four districts. The sessions were held from May 5, and August 27 2015 in Niore, on May 11, 2015 in Malem Hoddar and Koumpentoum and on May 12, 2015 in Koungheul. Overall, 51 HPNs were oriented and the purpose was to prepare the IEC mobilizers for mobilization. The topics covered in this orientation included:

- An update on the counseling card, a job aid describing essential IRS messages for the IEC mobilizer;
- Guidelines for the campaign specially for household preparation;
- Messages to be delivered during the mobilization;
- How to fill out data collection forms;
- Supervision of community IEC mobilizers;
- Structure identification and data entry;
- Ensuring mobilization data quality; and
- Training methodology.

Following this training, under the supervision of NMCP, SNEIPS, and AIRS Senegal staff, HPNs conducted trainings for 866 IEC mobilizers and 90 community supervisors in the four districts

TABLE 3. NUMBER OF MOBLIZERS AND SUPERVISORS TRAINED ON IEC

	IEC Mobilizers			Community Supervisors		
	H	F	T	H	F	T
Nioro	88	282	370	26	12	38
Malem	11	18	29	1	3	4
Koungheul	77	96	173	11	6	17
Koumpentoum	171	123	294	22	9	31
TOTAL	347	519	866	60	30	90

4.3 IEC ACTIVITIES

IEC activity planning and implementation was conducted at the district level. AIRS Senegal provided technical assistance in the validation process for communications plans. However, a delay due to the funding availability did not allow district teams to carry out the mobilization activities according to the communication planning. Nevertheless, the results were satisfactory partly because of the high involvement of the district teams in the IEC implementation process.

However, AIRS Senegal faced persistent difficulties mainly in urban areas where major refusals were observed, especially in Koungheul. Refusal rates were 0.55% and 0.49% in 2014 and 2015, respectively. The refusal cases in urban areas seem recurrent in the last few years, which led supervisors at all levels (districts, communal HPN) to accompany IEC mobilizers into households to help with appropriate solutions. These refusal cases resulted in temporarily delaying SOPs progress calendar, which did not affect the overall progress plan. In addition, local administrative and political authorities were actively present in those areas for refusal case management.

Most of the district team was involved in the collection of IEC data collection and the resolution of refusal cases. Some innovations were noted that include the IRS campaign journal produced daily by Koumpentoum district informing about key IRS activities accomplished. In Koungheul district, youth groups volunteered to help beneficiaries for the preparation of households for an appropriate spraying.

As recommended, IEC mobilizers accompanied SOPs the day of spraying, which contributed to the reduction of refusals or at least brought up some refusal cases to authorities for early case management.

4.4 IEC SUPERVISION

In the IEC supervision plan, it was mentioned that the personnel from NMCP's national level would be in the field at the startup of mobilization activities to assist the district personnel to create a sound supervision framework. However, funding was not available for NMCP travel so AIRS Senegal's IEC coordinator assisted districts during the startup of IEC mobilization for the first week.

AIRS Senegal's IEC coordinator presence in the field during the first few days of IRS to assist district teams was crucial for solving refusal cases, particularly in Koungheul district. In addition, the NMCP IEC focal person was fully informed about the situation in the field.

The NMCP was in the field during the second week of the campaign to ensure that mobilization strategies put in place to overcome refusal cases in urban areas were fully applied and strengthened. Strategies included involving local and administrative authorities in the management of the refusal cases,

ensuring that the district team and HPN responsible for the area is in the field to help mobilizers to solve refusal cases, and helping organize the voluntary youth groups intervention on house preparation as needed.

Tables 4 show some of the IEC campaign results.

TABLE 4. IRS SENSITIZATION RESULTS (HOME VISITS)

District	Households accepting IRS during Door-to-door (DTD) visits	Households Refusing IRS during Door-to-door visits	Number of Women informed during DTD Visits	Number of Man Informed during DTD Visits	Number of Persons Informed during DTD Visits
Nioro	15,097	113	51,149	33,160	84,309
Koumpentoum	8,678	15	25,802	20,982	46,784
Malem Hoddar	899	0	2,283	973	3,256
Koungheul	7,541	42	21791	13,704	35,495
TOTAL	32,215	170	101,025	68,819	169,844

Source: PMI AIRS Senegal 2015 database

TABLE 5. IRS CAMPAIGN COMMUNICATION MATERIALS

Items	No. produced by NMCP (through AIRS Senegal)
Counseling cards	302
Messages sheets laminated	458
Trainer's guide	32
IEC mobilizer's manual	435
Booklets/brochures	1,129
T-shirts	3,550
Streamers	89

5. IMPLEMENTATION OF IRS ACTIVITIES

5.1 SPRAY CAMPAIGN LAUNCH CEREMONY

On May 21, 2015, AIRS Senegal held an official launch ceremony at the national level for the 2015 campaign in Nioro at the IRS operational site of Keur Madiabel. The ceremony was organized by NMCP, AIRS Senegal, and the DHMT, and chaired by the Prefect of Nioro. It was attended by local administrative bodies, village leaders, community leaders, youth associations, community workers/IEC mobilizers, and community members from Keur Madiabel and the neighboring villages. The event raised awareness about community needs and provided information on the importance of IRS.

The 2015 spray campaign began on May 22 in all districts. The remaining carbamates were used in Nioro; this second campaign started September 5, 2015. Spray operations were completed within 20 operational days per district, but over 24 operational days total since not all districts sprayed on the same days; operational sites were afforded off days that were not on the same day across the country. The spraying in Nioro using the carbamates was completed in ten operational days.

AIRS Senegal sprayed organophosphates within in all districts and the remaining carbamates in Nioro. Spray operators used Goizper pumps used in Koumpentoum and Nioro and Hudson pumps in Koungheul, Malem Hoddar, and Nioro. In order to improve management of spray pumps, spray operators' roles and responsibilities were reviewed and progressive rinsing of spray pumps, previously performed by pump repair technicians, was reassigned to spray operators. Pump repair technicians were in charge of supervising the progressive rinse and measuring insecticide leftover after spraying. As in 2014, beneficiaries reported being happy with the organophosphate product. Not only did the product protect households from mosquitoes carrying the malaria parasite, but it also helped households with pest control of other small insects.

In total, 968 seasonal workers hired by AIRS Senegal (including SOPs, site managers, team leaders, washers, storekeepers, assistant logisticians, accountants, repair technicians, security guards, drivers, and others) were deployed to the 27 sites in four target districts, as shown in Table 6.

TABLE 6. NUMBER OF PEOPLE HIRED

Position	Male (M)	Female (F)	TOTAL
SOPs	391	148	539
Operational site managers	23	4	27
Team leaders	84	25	109
Data entry clerks	10	12	22
Storekeepers	22	9	31
Finance assistants	2	2	4
Logistics assistants	0	3	3
Repair technicians	29	1	30
Washers	0	58	58
Guards	42	0	42

Drivers	73	0	73
Water suppliers	0	5	5
Office and operations sites cleaners	0	25	25
Total M/F Hire for IRS	676	292	968

The 27 sites were distributed as follows: 15 in Niore, six in Koumpentoum, five in Kounghoul, and one in Malem Hoddar. At each operational site, AIRS Senegal deployed two to five teams of four to five SOPs. Spray teams worked six days per week with average hours of operation from 7 a.m. to 2 p.m.

Before leaving for the spraying sites, all SOPs were provided breakfast by a person selected in collaboration with the local hygiene agent. In addition, SNH agents conducted daily supervision on the quality of food provided. Vans were arranged to transport SOPs to and from spray villages. After returning to the operational site, SOPs returned PPE, unused insecticide and empty bottles, cleaned themselves, and went home. In some remote operational sites, SOPs camped overnight (i.e. with communities providing lodging and the project covering food cost and other supplies).

Prior to the start of spray operations, 885 seasonal workers (including SOPs, team leaders, site managers, washers, storekeepers, and repair technicians pumps) underwent a general medical examination to assess their medical fitness for IRS activities. As per the project's policy and practices, all female personnel took a pregnancy test at the start of the spray campaign. After 15 days of spraying, two tested positive for pregnancy in Koumpentoum and were redeployed as operational site assistants to ensure their income while eliminating their exposure to insecticides. To minimize health risks, all SOPs received complete sets of personal protective equipment that included helmets, face shields, nose and mouth masks, long-sleeved cotton overalls, rubber gloves, pairs of cotton-rich stockings, robust gum boots, and neck covers.

In addition to the organophosphate campaign, AIRS Senegal, in collaboration with NMCP, sprayed the remaining bendiocarb stock (6,279 of the 7,412 remaining sachets) in Niore in September 2015.

5.2 OPERATION COORDINATION AND SUPERVISION

For adequate coordination of spray operations, there were regular meetings at site and district levels. Coordination and supervision activities are described below.

5.2.1 COORDINATION AT SITE LEVEL

Coordination at site level was conducted daily and concerned all actors, namely: site managers, HPNs, community supervisors, and local SNH supervisors. All issues encountered during IRS implementation were discussed at the site level for an immediate solution. IEC mobilizers were informed of any change in spray calendars for better coordination in the field.

5.2.2 COORDINATION AT DISTRICT LEVEL

Coordination at the district level was conducted under the leadership of the DMO or his/her representative and involved all supervision actors (central and regional level SNH and PMI AIRS team) and DHMT. Issues were also discussed during those meetings to come up with solutions and ensure smooth execution of activities on the ground.

5.2.3 OPERATIONS SUPERVISION

Supervision of the IRS campaign involved identification of potential problems, immediate correction of inadequacies, and problem-solving leading to improved program performance and helping to ensure a

successful overall campaign. The IRS steering committee reviewed and validated the comprehensive IRS supervision checklist and supervision manuals for the use by all supervisors during the 2015 spray operations as listed in Table 7. In collaboration with the NMCP and other stakeholders, AIRS Senegal developed a supervision plan that is summarized in the following subsections and in Table 8.

TABLE 7. IRS-RELATED MANUALS USED FOR 2015 CAMPAIGN

Manuals	Status
Supervision manual	Reviewed
Training of trainers manual	Reviewed
Spray Operator Pocket Guide	Rewiewed
Operator booklet	Reviewed
Site manager guide	New
Store Monitoring plan	New
Team leaders guideline	New
District coordinator guide	Reviewed
Guide for logistics assistant	Reviewed
Storekeeper manual	Reviewed
Manual for pump repair technician	Reviewed
Guide for training on environment	Reviewed
Insecticide shipping guide	Reviewed
Manual on pesticide intoxication case management for physicians	Reviewed
Manual on pesticide intoxication case management for HPN	Reviewed
Guide for IEC mobilizers' trainer	Reviewed
Manual for IEC mobilizers	Reviewed
Manual on data collection	Reviewed

5.2.3.1 SUPERVISION AT SITE LEVEL

At the site level, each site had an average of three to four spray teams. Every team leader directly supervised the work of four to five spray operators. Site managers were in charge of overseeing team leaders' performance and also observing the work of spray operators and other actors on site, including washers and security guards.

Every site had one local supervisor assigned by SNH. After one week of supervision in a given site, those assigned SNH supervisors would rotate with their colleagues from other operational sites. At the end of the day, there were debriefing meetings with the team leader, site manager, and SNH supervisor to share the findings and lessons learned from the day and to make recommendations for the next day.

SNH supervisors and site managers played a key role in monitoring spray operations, particularly with the introduction of the smartphone for IRS supervision pilot in Koungeul and Malem Hoddar.

5.2.3.2 SUPERVISION AT REGIONAL AND NATIONAL LEVEL

Representatives from the SNH regional offices and the central level performed supervision visits to assess the progress and any issues with the campaign as well as to observe the performance of local SNH agents.

5.2.3.3 PMI AIRS SENEGAL SUPERVISION

Supervision has always been conducted throughout the period of spray operations. However, in 2015 the approach and frequency of supervision were enhanced. As a result, the working relationship between the AIRS Senegal team, DHMT, and local SNH significantly improved. Specifically, all AIRS Senegal technical staff worked in the field during the length of the campaign, performing close supervision and coaching in all aspects of the operations. They specifically focused on the supervision of spray techniques, EC, IEC mobilization, stock management, and handling of the insecticide. In addition, SNH officers were widely dispatched to each district to conduct daily supervision in all operational sites. Careful and consistent supervision was a key factor of success during this spray campaign.

NMCP's Director, PMI, UCAD, SNH's Director, and AIRS Senegal's COP visited the field to supervise IRS activities. The team observed all aspects of operations including spray techniques, environmental compliance, warehouse, end of day activities, beneficiaries' appreciation, etc. They met the DHMT and administrative authorities and shared IRS issues and make recommendations particularly on IEC Mobilization.



Source: AIRS Senegal: Steering committee supervision in Koumpentoum district SNH Director visit in Koungheul District

From left to right: SNH Director, UCAD, PMI AIRS COP and PMI/USAID

Two supervision visits were carried out by the M&E manager and Home Office Technical Program Manager. They supported M&E activities, managed inventories, and oversaw IRS operations.



Source AIRS Senegal: Visit of TPM in Koungheul warehouse
with PMI AIRS Operations Manager

While in the field the AIRS Senegal team provided coaching to the SNH officers, DREEC, and DHMT on how to conduct proper supervision using the smartphones for supervision. (For more on the smartphone pilot for supervision please refer to Section 5.3)

Supervision also focused on:

- Making sure spray calendars are implemented as planned and monitoring spray operators' daily performances to prevent any voluntary slowdown in operations by spray operators;
- Strengthening working relationships between various actors in the field; and

- Management of refusal cases in close collaboration with local authorities.

Supervision had an important impact on the following:

- Adhering to spray progress timelines in operational sites;
- Household preparation for quality of spray;
- Guidelines for insecticide mixture;
- Guidelines for structure marking and sip tying;
- Spray teams adhering to daily performance targets;
- No complaints from beneficiaries reported to authorities; and
- Refusal cases were managed successfully in spite of very few categorical cases.

In both 2014 and 2015, the increased ownership of government authorities has been evident. In 2015, the prefects of Koumpentoum and Koungeul both made visits to spray sites and contributed to solving some difficult cases of refusal. During the district evaluation meeting, Koumpentoum's Prefect presented awards for outstanding performance in this campaign.

In both Koumpentoum and Nioro, the DOM took a leadership role by enhancing information towards beneficiaries and strengthening community participation in the implementation of IRS in their districts.

Table 8 summarizes the spray operations supervision and monitoring schedule.

TABLE 8. SPRAY OPERATIONS SUPERVISION AND MONITORING SCHEDULE

Actors	Frequency	Supervised areas
District SNH staff	Daily visit during the entire period of spraying	Spraying techniques, environmental safety and compliance, spray operators' behavior IEC messages delivered Spray performance Spray organization in the field
SNH (regional and central)	2 visits for central-level and 2 for regional-level SNH	Spraying techniques, environmental safety and compliance, spray operators' behavior, supervision of SNH supervisors, IEC
Abt national and field Office Abt Home Office	Daily visit during the entire period of spraying 2 visits (M&E and TPM)	Spraying techniques, environmental safety and compliance, spray operators' behavior, supervision of SNH supervisors, management of storekeepers, IEC message delivered, spray performance
NMCP	3 visits during the campaign	Field organization, environmental safety and compliance, partner relationships, supervision of SNH supervisors, IEC component
PMI/USAID, UCAD, SNH and NMCP national level,	2 visits by IRS focal persons 1 visit from central level 1 visit external EC inspection	Field organization, partner relationships, supervision, EC, management of storekeepers, availability and status of materials stock, IEC, Spray performance, beneficiary satisfaction
DHMT	8 visits for IEC mobilization; 11 visits for spray operations	IEC, spray operations and beneficiaries' impressions; IRS operations in joint supervision with Abt staff; IEC mobilization
Local leaders (prefet, mayors, etc.)	2 visits throughout the campaign	IEC mobilization, oversight of entire IRS operations, solving refusal cases

5.3 SMARTPHONES FOR SUPERVISION

In an effort to improve, standardize, and automate supervision, AIRS Senegal and its subcontractor Dimagi, Inc. updated smartphone applications for daily SMS reporting and IRS operations supervision.

During the campaign, the Home Office M&E Specialist visited Senegal to oversee and provide assistance with the implementation of this system.

5.3.1 EQUIPMENT USED

AIRS Senegal distributed 50 Samsung Galaxy pocket phones to SNH supervisors, site supervisors, and project staff. The AIRS Senegal team along with Dimagi updated the mobile application components of the supervision forms on each phone and also set up an email address where users would receive the daily reports for the supervisor’s teams.

The following supervision forms were included in the smartphone application:

1. Spray operators’ morning mobilization and vehicle inspection;
2. Structure preparation and observations on spraying techniques;
3. Spray operators’ return at the end of day;
4. Storekeepers’ performance monitoring; and
5. Three checklists for EC inspection were uploaded in the same smartphone. Two for pre-IRS inspection related to site validation and one form for post-IRS inspection.

5.3.2 IMPLEMENTATION, STRENGTHS, AND CHALLENGES OF THE mHEALTH SUPERVISION

Local supervisors completed the forms on a daily basis. Site managers were in charge of spray operators’ morning mobilization and their return to base. Central level supervisors (AIRS Senegal staff and SNH supervisors) and regional level SNH also completed sub-forms but did not systematically follow spray teams for a full day.

Dimagi, Inc. sent automated reports from these supervision checklists to a list of stakeholders that had been provided by AIRS Senegal. Every day around 6:00 PM supervisors would receive the supervision data as an e-mail, which they could access on their smartphone in a tabular format as well as an MS Excel attachment.

Some of the strengths of the smartphone pilot for supervision included:

- SMS reports reviewed daily by M&E team before sharing with partners and stakeholders;
- Daily sharing of supervision reports with users and stakeholders in the implementation; and
- Automatic updates of the mobile application.

Table 9 summarizes challenges and solutions for system implementation.

TABLE 9. CHALLENGES AND SOLUTIONS FOR SYSTEM IMPLEMENTATION

Difficulties Encountered	Alternative Solutions Proposed
SMS	
The SMS report generated by the CommCare platform by Dimagi, Inc. was difficult to understand and explore	Development of a new Excel report template using data sent from the CommCare platform

Some data sent by team leaders were incorrect. Inability to enter the system to correct SMS data errors manually (guide not available to access the system)	Sometimes daily call to all district coordinators is needed to compare data they have with those sent by CommCare
During the first campaign, the SMS job aids were sent very late to the operators and AIRS staff in the field during implementation.	Require Dimagi, Inc. to send SMS job aids on time. (This issue was corrected during the 2 nd campaign).
SMS job aid worked only for ten days during the first campaign.	Ensure that the gateway phone has sufficient phone credit in advance and test system prior to spray campaign. (The system was tested before starting the 2 nd campaign in Nioro).
Electricity outage in Dakar office temporarily blocked reception and sending of reports	Reactivate mobile data on the smartphone that is used as a gateway for sending/receiving SMS data
Mobile Application	
During first campaign, the application was not entirely ready before the TOT. The report template was not shared with the users and partners during the training and before the campaign.	Train users on how to access the report and share the training guide. (These failures were corrected during the second campaign).
Network connection problems experienced in some areas (sending and receiving)	Move to areas where the network is available (sometimes at the end of the day smartphones are brought back to the district level to perform updates).
During first campaign, site validation and vehicle inspections were conducted using the questionnaire, however one application was not finalized and uploaded in the smartphone before the validation of sites and vehicles by ECO	Corrected during the second campaign
Accessing environmental inspection data is difficult, requests are not provided	Questionnaires are manually searched.

NB: Several of these problems were resolved in Nioro's second campaign.

5.4 SPRAY PERFORMANCE TRACKING SHEET

In 2015, AIRS Senegal continued using the Spray Performance Tracking Sheet (SPTS) tool introduced in 2013 and reviewed in 2014 in all four target districts. This tool allowed daily tracking of SOP performance and the use of insecticide. After analyzing the data, site managers communicated feedback to the team leaders and provided recommendations and corrections as needed. They also shared the performance results with the DHMT and other partners on a daily basis.

Site managers were responsible for recording the performance data. They worked with storekeepers to input information on insecticide use on the SPTS on a daily basis. This information was available to DCs

and shared with DMOs. In addition, AIRS Senegal synthesized the data and shared it every week with all partners including PMI, NMCP, SNH, the district health team, and PMI AIRS Home Office. This tool was highly appreciated by all stakeholders visiting operations during the campaign.

5.5 LOGISTICS AND STOCK MANAGEMENT

In 2015, the lessons learned in 2014 in managing large quantities of batches of insecticides organophosphates were applied. To that end, district warehouses were supplied more frequently because of the space limitation for restocking and stock monitoring.

As for the insecticide, a warning threshold was established in each district central storage facility based on the total insecticide stock for each site. From there, two pesticide re-stockings were carried out over the course of the campaign to avoid stock-outs or the potential for any stock-outs.

6. POST-SPRAY ACTIVITIES

6.1 SUMMARY OF POST-SPRAY ACTIVITIES

Post-spray activities included campaign evaluation meetings at the site, district, and national level; demobilization of commodities; site rehabilitation; and solid waste management, which are covered in Section 9. Table 10 provides details on each post-spray activity.

TABLE 10. POST-SPRAY ACTIVITIES

Activities	Responsible Party	Results
Pregnancy tests	DMO	Completed
Site-level IRS evaluation	HPNs, SOPs' site managers, team leaders and SOP, religious and community leaders, elected officials and AIRS	Completed
District-level IRS evaluation	DHMT, HPNs, site coordinators, district high level authorities, religious and community leaders, local elected officials local media and PMI AIRS	Completed
National-level IRS evaluation	Country-level partners, local elected leaders, UCAD, SNH, SNEIPS, DMOs, PMI AIRS, local media	Ongoing
IRS site closeouts	PMI AIRS district staff	Completed
Data cleaning and archiving	M&E team	Completed
Waste disposal	PMI AIRS SOCOCIM, NMCP Sodiaplast, DEEC	Ongoing

6.1.1 POST SPRAY EVALUATION MEETINGS

At the post-spray evaluation meetings, participants identified strengths and limitations of the 2015 spray campaign planning and implementation.

6.1.1.1 STRENGTHS

- AIRS Senegal's capacity building of regional and district agents involved on IRS implementation.
- Close supervision of spray operations at all levels provided by all stakeholders and partners (AIRS Senegal and PMI AIRS Home Office, SNH, NMCP, regional and district health offices, DEEC/DREEC, UCAD, USAID/PMI).
- Dispatching and coding of spray operators' materials by site managers and team leaders the day before the start of spray operations prevented delays that are common to first days of spraying.
- Making a DHMT member available to the program as an IRS focal point for better activity monitoring by the district.
- Establishing a voluntary group of youth to help beneficiaries in household preparation before the arrival of spray teams in Kounheul district.
- Reducing the number of road accidents (zero cases in all districts) and poisoning cases (zero cases in 2015 versus one in 2014).
- Gender results with 41% (including mobilizers) women trained in 2015 versus 20% in 2014.

- Distributed insecticide and other equipment prior to the IRS start.
- Shared SPTS and daily performance monitoring.
- Coordinated spray calendars with home visit (mobilization) schedules to ensure home visits occurred within 48 hours before spray.
- Involved local authorities in IRS implementation activities (micro-planning, supervision) and evaluation workshops for better IRS ownership and future transfer.
- Strengthened commitment from key stakeholders (SNH, NMCP, districts).
- Improved management of refusal cases.
- Improved coordination at all levels for quick strategic decisions and management actions.
- Effectively involved DREEC agents in IRS campaign implementation.
- Availability of a professional from Goizper pump manufacturer for refresher training of SOPs.
- Improving use of SMS for reporting, supervision using smartphones, and use of mobile soak pits.
- Initiating job aids for operators awareness during operations.
- Completing IRS campaign in 20 operational days versus 30 operational days in 2014 per district.

6.1.1.2 LIMITATIONS AND IMPROVEMENT AREAS

- Capacity of MOH and particularly, DHMT, to implement IRS activities along with the routine activities of the health center. The current human resources capacities at both the NMCP and district health offices will not allow these local organizations to fully implementation IRS operations.
- Low educational level of seasonal workers. It was noticeable among some spray operators and IEC mobilizers when filling out data collection forms.
- Inadequate number of colored zip ties (white and red) and difficulty in finding support of zip ties on the structures.
- Frequent drop out of SOP after training.
- Supervision checklist running time, questionnaire chronology, relevance of some questionnaires, late introduction of some questions (e.g. use of a flash light, use of straw to drink water during spraying); length of supervision time using questionnaires.
- IEC mobilization in urban areas: high number of refusals.
- DREEC: agents trained on supervision tools not available for supervision in the field.

6.2 DEMOBILIZATION OF COMMODITIES

Following completion of spray operations, the project moved the leftover insecticide, equipment, and PPE from the 21 operational sites to the three district-level warehouses, and then all leftover insecticide and solid wastes were transferred to the main warehouse in Kaolack. Annex A details the post-spray inventory of the equipment and supplies available in the central warehouse.

7. ENTOMOLOGY

In Senegal, USAID/PMI through AIRS Senegal worked with UCAD to provide entomological monitoring in the IRS target districts. The specificity for 2015 is the update for the sentinel sites according to the hot spot strategy. Entomological data are being collected in villages belonging to selected health posts in hot spot areas and in non-treated areas. UCAD conducted cone bioassays two months after the spray with susceptible strains of *An. gambiae* s.l. in the four IRS districts (Koumpentoum, Malem Hoddar, Kougheul and Nioro). The purpose of the tests is to assess the residual life of the insecticide sprayed.

In each district, there are two sprayed villages and one non sprayed village as sentinel sites (Table 11).

A joint visit was conducted by NMCP (entomologist), UCAD (Pr Faye) and AIRS Senegal (COP and TM) in late September to supervise the entomological monitoring teams in the field. The joint team noted that the bioassay results indicated that the mortality was very low in Malem Hoddar compared to other districts in the same period and concluded that the tests were not well done by the entomology team who made the same error in Nioro in August. The tests conducted in September in Nioro and in October in Malem Hoddar by another team corrected these errors. Consequently, both data sets from Malem Hoddar in September (i.e. Month 4) and Nioro in August (i.e. Month 3) have been dismissed for inaccuracy. The team concluded that both NMCP and AIRS Senegal should supervise entomological monitoring activities in the field to ensure better study results.

TABLE 11. SENTINEL SITES FOR ENTOMOLOGICAL MONITORING

Health District	Sprayed Villages	Non-Sprayed villages
Nioro du Rip	Ndramé Dimb, Bamba Diakhatou	Paos Koto
Koumpentoum	Koumaré, Village I	Kouthiaba
Malem Hoddar	Makka Bella, Tip Saloum	Diankhé Souff
Kougheul	Ida Mouride, Pakala	Keur Serigne Diabel

The number of houses used for cone bioassays for each district is in Table 12.

TABLE 12. NUMBER OF HOUSES USED FOR BIOASSAYS

Month after spray	2 months		3 months		4 months		5 months	
	Control	Test	Control	Test	Control	Test	Control	Test
District								
Koumpentoum	3	9	3	9	3	9	2	8
Koungheul	3	11	2	10	2	10	2	10
Malem Hodar	3	15	2	10	-	-	01	05
Nioro	2	10	-	-	2	10	-	-

Results for bioassays tests from July to September are summarized in Tables 13, 14, 15 and 16. Results from Koumpentoum, Koungheul, Malem Hoffar and Nioro showed good efficacy up to 5 five months. Bioassays are ongoing in all districts.

TABLE 13. CONE BIOASSAY RESULTS, KOUMPENTOUM

Month after spray		2 months	3 months	4 months	5 months
Exposed	Test	284	300	282	235
	Control	106	80	83	84
Death 24 h	Test	284	291	246	204
	Control	02	05	01	10
Mortality rate 24 h (%)	Test	100%	96.8%	87.2%	85.0%
	Control	01.9%	06.2%	01.2%	11.9%

TABLE 14. CONE BIOASSAY RESULTS, KOUNGHEUL

Month after spray		2 months	3 months	4 months	5 months
Exposed	Test	353	300	300	293
	Control	123	80	80	71
Death 24 h	Test	353	300	293	262
	Control	02	00	01	01
Mortality rate 24 h (%)	Test	100%	100%	97.7	89.4%
	Control	01.6%	00.0%	01.2%	01.4%

TABLE 15. CONE BIOASSAY RESULTS, MALEM HODAR

Month after spray		2 months	3 months	5 months
Exposed	Test	466	317	150
	Control	125	81	40
Death 24 h	Test	445	314	129
	Control	09	00	4
Mortality rate 24 h (%)	Test	95.2%	99.1%	84.4%
	Control	07.2%	0.0%	10%

TABLE 16. CONE BIOASSAY RESULTS, NIORO

Month after spray		2 months	4 months
Exposed	Test	300	393
	Control	80	83
Death 24 h	Test	300	321
	Control	00	4
Mortality rate 24 h (%)	Test	100%	81.7%
	Control	00%	4.8%

8. MONITORING AND EVALUATION

AIRS Senegal drew lessons learned from the 2014 spray operations and made improvements to the M&E system for the 2015 campaign to:

- Emphasize accuracy of both the data collection and the data entry processes through comprehensive trainings and supervision at all levels.
- Streamline and standardize data information flow to minimize errors and facilitate timely reporting and use of data for effective and better IRS operations.
- Improve data sharing with NMCP and other stakeholders in anticipation of NMCP ownership of IRS M&E by sharing spray progress on a daily and weekly basis. Ensure IRS data security and storage for future reference through establishment and enforcement of proper protocols.

8.1 DATA COLLECTION

The data collection closely followed the process described in the country work plan. The project employed 17 data entry clerks (DECs) to enter mobilization and spray data from operations in the first half of the campaign (Koumpentoum, Kougheul, Nioro, Malem Hoddar). AIRS Senegal established four data entry centers with one DEC sitting in Malem Hoddar, four in Koumpentoum, four in Kougheul, and eight in Nioro. Each of the DECs received a laptop that contained the AIRS Senegal Access database. DECs entered Spray Operator Forms into the Access database and transmitted the results to the central office in Dakar within 24 hours of the receipt of the data. The networking access built into the database, which used the Microsoft Access program, was able to provide automated real-time updates of spray progress reports both locally and at the PMI AIRS Home Office. Once entered, the paper forms were filed and archived at the data entry sites.

As in 2014, to reduce the variances between data summary forms and spray operators' (compound) forms, a ratio of totals and details was established in the database. This approach was very helpful to DECs as it enabled them to immediately identify errors on spray forms or in the data entry, and clean the data the same day it was entered.

8.2 MOBILE HEALTH

In 2015, AIRS Senegal continued implementing two innovative mHealth activities to improve access to real-time information and allow the team and steering committee to better supervise the spray campaign. With the help of a subcontractor, Dimagi, Inc., AIRS Senegal implemented the SMS data reporting pilot in all four spray districts and implemented the supervisory forms on smartphones in all districts as described earlier in this report. AIRS Senegal worked with Dimagi, Inc. to update the basic phones and smartphones, as well as to format the subsequent reports and guide preparation, training, and supervision.

8.2.1 SMS DATA REPORTING

In 2015, AIRS Senegal used an SMS data reporting system whereby team leaders would send, via SMS, their daily operational data.

The spray data was sent by the Dimagi, Inc. CommCare system in a simple MS Excel style format via email. However, during the campaign, the report format was reviewed and modified into a more user-friendly format and sent to the AIRS Senegal and Home Office staff, AIRS partners and the Steering Committee on

a daily basis. This allowed the operations team and other stakeholders to receive and process the data immediately, and thus take urgent action, if needed.

Each day, team leaders would send an SMS with the following data for their teams:

1. Number of spray operators working/day/team;
2. Total number of rooms found/day/team;
3. Total number of rooms sprayed/day/team; and
4. Number of bottles used/day/team.

Users of the SMS system found it to be very user-friendly, and those who received the data were happy to have the data at their disposal on a daily basis.

For SMS data collection and reporting, DCs, site managers, team leaders, and storekeepers in the four districts were trained. Overall, 109 team leaders were trained for daily SMS data reporting. DCs' roles and responsibilities were to make sure team leaders sent their SMS data. If team leaders did not send in their data by 6:00 PM, DCs would SMS in the team leader's data. Storekeepers received training on mobile phone inventory management (security and recharging).

In total, 27 operational site managers and 31 storekeepers in all districts were trained on the mobile supervisory forms and SMS data reporting. In addition, 55 SNH staff (including four female assistants), 1 DEEC and three DREEC from Kaffrine, Kaolack, Tambacounda region were trained on the mobile supervisory form.

8.3 DATA QUALITY ASSURANCE

8.3.1 DATA COLLECTION/IN-FIELD VERIFICATION

Data quality assurance activities were instituted for both data collection and data entry verification through updated supervisory tools and the standard database audit checks. AIRS Senegal's data quality assurance efforts significantly reduced the number of errors found on Daily Spray Operator Forms and in the M&E database, improving the overall quality of the data and IRS results. Table 17 describes which data quality assurance forms were used throughout the campaign and the corresponding percentage of structures verified.

TABLE 17. SUPERVISORY TOOLS USED

M&E supervisory tools	Structures verified	Percent of errors found (number of errors divided by the number of records verified)
Error Eliminator	Completeness and accuracy of data: heading information (169,340 lines)	0.6%
	Completeness and accuracy of data: structure information (173,818 lines)	0.3%
	Logic Control (103,171 lines)	0.4%
Data Collection Verification	985 compounds	1.0%
Data Entry Verification	3,392 lines	1.6%

8.3.1.1 ERROR ELIMINATOR

AIRS Senegal supervisors, team leaders, and site managers used the Error Eliminator (EE) daily to detect and correct common errors on Spray Operator Forms before they were transported to the data center. Common errors included arithmetic mistakes and failure to complete all data items on the Data Collection Forms.

8.3.1.2 DATA COLLECTION VERIFICATION FORM

AIRS Senegal senior management, local supervisors, and SNH Supervisors used the Data Collection Verification (DCV) tool to interview households to verify spray coverage data; 985 compounds were visited using the DCV form. The most frequent types of errors were related to the counting of the population (the number of people found during spray operations is different from the number of people found during the verification process). Corrections were done by cross-checking the data recorded on the spray operator forms. Staff performed these verification visits within approximately two days of spraying and identified errors in enough time to correct mistakes and notify spray operators and team leaders to prevent repeat errors. Errors found from DCV in 2015 (1.0%) are lower as compared to 2014 (1.5%) indicating higher quality of data collection.

8.3.2 DATA ENTRY VERIFICATION

8.3.2.1 DATA ENTRY VERIFICATION FORM

The M&E and database managers and the database supervisors used the Data Entry Verification tool to verify that the data entered into the database matched the data on the Daily Spray Operator Forms. They found far fewer errors in 2015 compared to last year as a result of the in-field supervisory verification tools (i.e., Error Eliminator and DCV tools), and the data cleaning tool that compares spray totals to spray details and was installed on every DEC's computer. In 2015, 3,392 lines were verified using the Data Entry Verification Form and 54 errors were identified and corrected. The DEC's were re-trained when required.

8.3.2.2 ACCESS DATABASE AUDIT LOCKS AND DATA CLEANER

In addition to the database validation rules (e.g., the number of pregnant women in the structure cannot exceed the number of women in the structure), the database manager verified all data entered into the database daily. On a daily basis, the database manager would also send errors to the DEC's and database supervisors for immediate cleaning. Each week, the M&E manager double checked data before sharing with the team. This practice allowed AIRS Senegal to check and correct for any DEC's once all the spray data had been entered.

AIRS Senegal created reports of how these supervisory tools were used and common errors; these reports were shared with the project home office regularly, which allowed the home office to follow up on any problems with data collection or data inconsistencies.

Improved data entry allowed for the production of weekly spray reports with the most up-to-date data.

8.4 SPRAY RESULTS

All AIRS Senegal performance indicators are presented in a Monitoring and Evaluation Plan matrix in Annex C. Details of some key IRS indicators, such as number of structures sprayed and people protected are provided in the following sections of the report.

8.4.1 SPRAY DATA

The total number of structures found by spray operators was 133,252 and the number of structures sprayed was 130,170. With that, the overall spray coverage was 97.7%, as shown in Table 18.

The total population protected by IRS in 2015 was 514,833, protecting 98.3 percent of the target population. Of these, 89,574 children under the age of five and 9,936 pregnant women were protected.

TABLE 18. IRS COVERAGE: ELIGIBLE STRUCTURES SPRAYED AND POPULATION PROTECTED IN TARGETED AREAS

District	Total # of eligible structures found by SOPs	Total # of eligible structures sprayed	% of total structures sprayed	Population protected	Pregnant women protected	Children under 5 protected	% of population protected	Eligible Rooms	
								Found	Sprayed
KOUMPENTOUM	36,655	36,140	98.6%	123,598	2,769	22,716	98.6%	45,704	45,103
KOUNGHEUL	32,569	31,284	96.1%	105,342	2,200	18,808	96.7%	45,995	44,299
MALEM HODDAR	4,458	4,361	97.8%	13,668	271	2,591	98.3%	5,445	5,337
NIORO	59,570	58,385	98.0%	272,225	4,696	45,459	98.7%	123,407	121,786
TOTAL	133,252	130,170	97.7%	514,833	9,936	89,574	98.3%	220,551	216,525

8.5 EVALUATION OF HOT SPOTS

AIRS Senegal developed a monitoring and evaluation plan in collaboration with NMCP and PMI/Senegal to assess the effect of focal spraying in terms of value added compared to the previous approach of blanket spraying. Specific objectives were to identify comparative advantages and drawbacks in the implementation of the hot spots approach versus blanket spray, to compare the costs of each approach, and to assess the effectiveness in achieving the objectives of each approach.

The main indicators measured the malaria incidence in children under age five, the IRS performance, and the cost efficiency. AIRS Senegal analyzed malaria incidence data in the six target health posts (three in hot spots and three in non-hot spots). In each of the four IRS districts, health posts were selected in such a way that they overlapped with entomological sentinel sites to facilitate epidemiological data analyses. A separate report evaluating the focal spraying approach will be provided.

8.5.1 INSECTICIDE CONSUMPTION

A total of 41,239 bottles of organophosphate (Actellic 300CS) were distributed to the districts, and 32,925 were used to spray 111,201 structures (Table 19) with 3.4 structures covered per bottle. Of the remaining 7,412 carbamate (FICAM) sachets distributed to Nioro, 6,279 sachets were used to spray 18,969 structures with 3.0 structures covered per sachet. On average, one bottle/sachet covered 3.3 structures and each spray operator sprayed 14.4 structures per day.

TABLE 19. INSECTICIDE USAGE AND SPRAY OPERATOR PERFORMANCE

District	# of bottles/sachets issued	# of bottles/sachets used	# of structures Sprayed	Average # of structures sprayed per bottle/sachets	# of rooms sprayed	Average # of rooms sprayed per /bottle
Koumpentoum	12,324	7,916	36,140	4.5	45,103	5.6
Koungheul	11,136	9,150	31,284	3.4	44,299	4.8
Malem Hoddar	1,344	1,065	4,361	4	5,337	5
Nioro	16,435	14,794	39,416	2.7	85,411	5.7
Total Actellic	41239	32925	111201	3,4	180150	5,5
Total Ficam	7,412	6,279	18,969	3.0	36,375	5.8
Total	48,651	39,204	130,170	3.3	216,525	5.5

Overall, PMI AIRS sprayed 130,170 structures with the average rate of structures per day of 14.4. The project also reports spray coverage by room because historically the Government of Senegal records and reports IRS results by room. The total number of rooms sprayed was 216,525 as shown in Table 20.

TABLE 20. RATE OF SPRAY PROGRESS

Districts	Structures sprayed	Rooms sprayed	# of days	# of spray operator days	Average # rooms/day	Average # structures/day
Koumpentoum	36,140	45,103	20	2,002	22.5	18.1
Koungheul	31,284	44,299	20	1,992	22.2	15.7
Malem Hoddar	4,361	5,337	11	275	19.4	15.9
Nioro (Actellic)	39,416	85,411	20	3,652	23.4	10.8
Total Actellic	111,201	180,150		7,921	22.7	14.0
FICAM	18,969	36,375	10	1,110	32.8	17.1
Total	130,170	216,525		9031	24.0	14.4

9. ENVIRONMENTAL COMPLIANCE

9.1 PRE-SPRAY ENVIRONMENTAL ASSESSMENT

9.1.1 BACKGROUND

AIRS Senegal operates under a Supplemental Environmental Assessment (SEA) amendment that was written and approved in 2015. The SEA covers the use of all WHO approved insecticides for IRS including pyrethroids, carbamates, and organophosphates for the period of 2015-2020. It also includes chlorfenapyr, which is currently under WHOPES review for IRS activities and is registered for similar use by the U.S. EPA. Whereas previous SEAs authorized PMI IRS activities in the five regions of Kaffrine, Saint Louis, Kolda, Kaolack, , Tambacounda, this SEA is applicable for IRS activities Kaolack, Tambacounda, Kaffrine and Kolda.

In Senegal, all four target districts have more or less difficulty reaching all spraying areas due to road conditions and/or longer distances, particularly in the rainy season. To overcome these difficulties, those areas were identified and sprayed first, before the heavy rains begun. Areas of high population density and those most accessible were sprayed later. In 2015, all districts were sprayed - as planned - in May and June before the full rainy season began. However, because of the short duration of the carbamates the remaining FICAM was sprayed in Nioro in September during heavy raining season. Recommended solutions for the 2015 IRS campaign were the use of camping sites and mobile soak pits in hard-to-reach areas.

9.1.2 PRE-SEASON ENVIRONMENTAL COMPLIANCE ASSESSMENT (PSECA)

AIRS Senegal and DREEC conducted a PSECA in all four districts to evaluate compliance with current environmental regulations and established standards. The role of the DEEC/DREEC was to ensure prevention and control of nuisance and pollution as part of IRS implementation.

9.1.2.1 IDENTIFICATION OF NEW SITES AND CLOSURE OF SOAK PITS IN PREVIOUS SITES NOT SELECTED

In February 2015, AIRS Senegal conducted site location assessments and produced detailed analyses for construction, rehabilitation, and upgrading of the operational sites. With the strategy of hot spots, previous sites in non-selected health posts were closed by decontaminating and restoring all soak pit areas to their original pre-IRS conditions. This was done in all sites in Velingara and in non-hot spot sites in other districts, in compliance with PMI environmental regulations. AIRS Senegal's ECO coordinated the decontamination process, in close collaboration with HPNs.

9.1.2.2 OPERATIONAL SITES REHABILITATION

Based on PMI Best Management Practices, the project set up 23 soak pits at the operational sites in the four target districts. AIRS Senegal put up fencing around the soak pit area and then fitted the fence with locks to keep out non-IRS personnel and animals. Soak pit areas were distributed as follows per district: Kougheul (5), Nioro (11), Koumpentoum (6) and Malem Hoddar (1).

TABLE 21. CONSTRUCTION AND REFURBISHMENT OF OPERATIONAL SITES

District	# of operational sites	Refurbished Sites (soak pits, storage facilities, fencing, etc.)
Nioro	15	15 new soak pits constructed 7 offices and storage facilities rented 8 offices and storage facilities provided
Koumpentoum	6	4 soak pits refurbished 2 new siles soak pits constructed 1 new mobile soak pit constructed 1 offices and storage facilities rented 5 offices and storage facilities provided
Koungheul	5	3 soak pits refurbished 2 new soak pits constructed 2 new mobiles soak pits constructed 4 offices and storage facilities provided by sector authorities 1 offices and storage facilities rented
Malem Hoddar	1	1 soak pits refurbished 3 new mobiles soak pits constructed 1 offices and storage facilities rented

9.1.2.3 SMARTPHONE ENVIRONMENTAL COMPLIANCE DATA COLLECTION SYSTEM

AIRS Senegal undertook two pre-environmental inspection trips in the four health districts. The first inspection was done two months before the spraying and the second ten days before.

AIRS Senegal utilized a smartphone data collection system in 2015 for the second pre-campaign inspection to record site characteristics, capture the GPS location, and take pictures of the site (storeroom exterior and interior, storage and condition of pesticide, if present, and condition of soak pit). The checklist and questions that were loaded onto the smartphone for this assessment were adapted from the checklists recommended in the PMI Best Management Practices Manual.

As a result of the generated worklist, the 23 sites and four central storage facilities in the four target districts passed all requirements in the first pre-campaign evaluation.

9.1.2.4 MOBILE SOAK PITS

In Senegal, all districts have temporarily inaccessible areas, particularly during the rainy season. In areas where operators must travel for more than 30 minutes to reach a spray site, a mobile soak pit is a useful option for minimizing risk related to the transportation of insecticide, and for potential reduction in cost of operations as well (i.e. fuel).

Ten mobile soak pits were used in health districts of Koumpentoum (one MSP in Kouthia Gaidi), Malem Hoddar (three in Ndioum Ngainth), Koungheul (two in Gainth Pathé), and Nioro (two in Keur Moussa and two in Keur Tapha) in areas that were deemed appropriate according to distances between households, number of spray operators per site, and accessibility

Team leaders and spray operators were in charge of MSP installation, use, and area restoration in all sites. In addition to their role of maintaining spray cans, repair technicians were in charge of collecting all amounts of returned insecticide and completing related daily inventory forms. Spray operators were in charge of rinsing spray tanks and stocking the remaining insecticide for the next spray day. Boots, helmets, face shields, and gloves were also cleaned by spray operators in containers with water and soap.

At the start of the campaign, AIRS Senegal's ECO supervised the installation and progressive rinsing in Malem Hoddar, Kouthia-Gaidi, Gainth Pathé, Keur Moussa, and Keur Tapha; spray operators were able to correctly install, clean, and store MSPs. Waste water drainage was done correctly with the use of MSPs.

Advantages of mobile soak pits included that progressive rinsing was more easily implemented, the average number of structures spray per operator increased, and the total number of days needed to complete the spray campaign decreased. Disadvantages of mobile soak pits included that the granular activated carbon had to be imported since it was very expensive locally, camping conditions were uncomfortable in some villages, and food had to be provided by AIRS Senegal. Further details about advantages and disadvantages are listed below.

Advantages of MSP:

- Progressive rinsing easily implemented: buckets of clean water and one 100 liter-drum used to collect all waste water generated per day.
- Slightly better performances of spray operators were showed in Gainth-Pathé where SOP daily performance increased on average to 18 (structures sprayed per SOP per day in 2015 from 16 structures sprayed per SOP per day in 2014). In Kouthia-Gaidi, performances maintained its same level as 2014 with MSP; however transportation costs were reduced significantly.
- During the rainy season, access to some villages is very difficult especially for vehicles that transport spray operators; thereby reducing distances allowed time saving and reduced risks of becoming stuck in the mud and accidents on impassable tracks.

Limitations of MSP:

- The granular activated carbon was imported because it is very expensive in Senegal.
-

A specific training session on MSPs was conducted during the 2015 IRS EC management training organized in Kaolack in April 2015 for all SNH and DREEC agents, and in May 2015 for concerned team leaders, site managers, and storekeepers. Practical training on MSP use was implemented by team leaders for spray operators prior to the start of spray operations.

9.2 INSECTICIDE

9.2.1 INSECTICIDE QUANTIFICATION

The initial estimate was based on the 202,764 structures that included Velingara. The insecticide order for 2015 was based on this data before the Senegal's IRS Steering Committee's decision on focal spraying. This estimate did not take into consideration the remaining carbamates.

The distribution of insecticide was based on the districts needs.

TABLE 22. ASSESSMENT OF INSECTICIDE NEEDS

District	Koumpentoum	Nioro	Velingara	Malem Hoddar	Koungheul	Total
Eligible structures*	36,965	85,484	49,805	2,458	28,052	202,764
No. of structures per bottle	3.2	3.2	3.2	3.2	3.2	
Insecticide bottles needed	11,552	26,714	15,564	768	8,766	63,364
Total need +10% buffer	14,519	13,186	17,120	845	9,643	69,700
Stock in place in 2014						21,029
Insecticide bottles procured						48,671

* Note: The quantification was based on the "number of structure" data available before the data cleaning was conducted.

9.2.2 INSECTICIDE CLASSES

Organophosphates were used in all districts in Senegal, which began spraying on May 22, 2015. Insecticide selection decisions were made by PMI and NMCP along with Senegal's IRS Steering Committee based on entomological and parasitological monitoring data from 2014.

On April 2, 2015, AIRS Senegal received the required official authorization from the Ministry of Environment to use Actellic 300 CS and Ficam® VC wettable powder for the 2015 IRS campaign. Prior to shipment, the insecticides underwent quality assurance and quality control testing by the manufacturers to ensure they were safe for spray in human households. 41,239 pirimiphos-methyl Actellic 300 CS bottles were distributed to the four health districts. In total, 32,925 bottles were sprayed.

In addition, 6,279 sachets from the remaining benthocarb stock (7,412 sachets) leftover from the 2014 spray campaign were used in Nioro from September 5-14, 2015.

9.2.3 INSECTICIDE TRANSPORT

In 2015, AIRS Senegal received three 40 foot long containers holding 48,671 bottles of Actellic 300 CS. The shipping from the disembarking port to AIRS Senegal's central warehouse in Kaolack was carried out by a shipping company specializing on insecticide transportation. The pesticides were at the warehouse 21 days before the start of the campaign.

After the inventory check at the main warehouse, the project staff coded the insecticide boxes before dispatching them to district storerooms and operational site storerooms where bottles were subsequently serialized. Insecticide transportation from the central warehouse to the four district storerooms was supervised by AIRS Senegal's Logistics Coordinator. Drivers received appropriate training on safety measures for pesticide transport.

For the dispatching of the insecticides to districts, AIRS Senegal rented ten ton watertight trunks. All environment compliance measures were observed.

9.3 AVAILABILITY OF ANTIDOTES

IRS poison management is the responsibility of the Government of Senegal (GOS) through the NMCP in collaboration with health facilities in the concerned health districts. The pre-IRS inspection noted the availability of atropine in each health facility in the four districts.

9.4 SEASONAL PERSONNEL PRE-IRS MEDICAL EXAMINATION

In April 2015 for Koumpentoum, Kougheul, and Malem Hoddar and May for Nioro, a total of 761 seasonal personnel (including 230 females) were examined as part of the pre-IRS medical check-up. Among the 230 females, 223 at reproductive age underwent pre-campaign pregnancy tests that all proved negative. In August 2015, 48 of 53 eligible females underwent pre-campaign pregnancy tests; all were negative.

9.5 MID-SPRAY ENVIRONMENTAL COMPLIANCE

9.5.1.1 SAFETY AND ENVIRONMENTAL COMPLIANCE

In collaboration with DREEC (at Kaffrine and Tambacounda), AIRS Senegal conducted the mid-spray EC inspections during the spray operations in the four IRS districts. To conduct these inspections, AIRS Senegal used the EC smartphones. Overall, each DREEC conducted six inspection visits for Kaffrine and Tambacounda.

Major findings during spray inspections were addressed immediately by the DCs with site managers, team leaders, and SOPs.

During the 2015 first spray round, 163 females (eligible³ for pregnancy test) underwent a second pregnancy test in June 2015, one month after the first test. Tests proved two positive cases in Koumpentoum. These women were reassigned as operational site assistants to protect their wages while otherwise avoiding any further direct contact with the insecticide.

9.6 POST-SEASON ENVIRONMENTAL ASSESSMENT

The AIRS Senegal team in collaboration with DREEC staff conducted post-spray inspections in all four target districts from June 23 to 28, 2015 and September 5 to 11, 2015 in Nioro.

Using smartphones, data were recorded for each of the 27 IRS sites and all forms were uploaded to the cloud database that is accessible by ECO from home office. After the IRS campaign, DCs contacted all landlords to inquire if their premises would be available for the next campaign so that repairs or temporary closings of soak pits could be made based on that information. The project successfully prepared all 27 sites for the off-season (note: four sites were sharing two soak pits during Nioro campaign): 23 soak pits were covered and locked including two soak pits (Gainth Pathé and Porokhane) that will be disposed of after three months (these sites will not be used for next year's operations). AIRS Senegal anticipates that some soak pits will be definitely closed if corresponding health posts are no longer eligible as hot spots for 2016 campaign. For soak pit disposal, the process will consist on three steps as follows:

³ 163 pregnancy test excludes substitutes, Malem Hoddar (11 days operations), older women, and some resigned females

- Demolition of soak pit and removal of its content;
- Backfilling and leveling soak pit hole with sand; and
- Reusing rubble stones for other soak pit construction.

9.7 IRS WASTE DISPOSAL

At the operational site level, solid wastes were packaged separately into boxes, numbered tightly, and closed. At the end of the campaign, all wastes were shipped to the district warehouse. At the district level, solid wastes were separated by items: 390 pairs of gloves and plastic sheets with holes were decontaminated by washing, sun drying, and packaging for disposal. Gloves with holes will be in public waste disposal and the others will be reused for the next campaign. All other solid waste including empty Actellic bottles (3,392 kg) and plastic sheets with holes will be sent to Sodiaplast in October 2015 for recycling into garbage pails, scrubbing brushes, chairs. 14,036 used masks and 32,925 empty Actellic bottles were packaged and transferred to the central warehouse in Kaolack.

A disposal plan was developed to dispose of obsolete waste such as electronics and other out of service materials or equipment. The electronic waste is shipped to a government-owned agency (State Informatics Agency) called e-waste specialized in repair and recycling; repaired items are given to schools as needed.

The 2015 IRS campaign generated contaminated solid wastes of 3,650 kgs composed of empty plastic bottles, gloves, and masks. The masks and empty sachets of the carbamates (FICAM) 230 kgs will be incinerated by SOCOCIM Cement Plant in September 2015. This incineration process follows the authorization (# 00826-MEDD/DEEC/DCPN/mbs) to incinerate issued April 08, 2015, by the Senegalese Ministry of the Environment and Sustainable Development, supervised by DEEC.

TABLE 23. INVENTORY OF CONTAMINATED SOLID WASTES

District	Contaminated items			
	Empty insecticide sachets	Empty insecticide bottles	Masks	Gloves
Nioro	6,279	14,794	6972	277
Koumpentoum		7,916	3,361	55
Koungheul		9,150	3,370	50
Malem Hoddar		1,065	333	8
Total	Sachets : 6,279	Bottles : 32,925	1,4036	390

Regarding the disposal of MSPs, all MSPs were stored at AIRS Senegal's district storage facility. For each layer, gravel was washed separately, sundried, and recycled; gravel will be reused in the construction of new MSPs. The activated carbon will be incinerated by SOCOCIM Industries along with other wastes after the campaign.

10. IRS COUNTRY CAPACITY ASSESSMENT

In 2015, AIRS Senegal conducted training, capacity-building, and advocacy at the regional and district levels as a means of achieving IRS sustainability. The training is described in Section 3.3.1.

In 2015, AIRS Senegal planned to coach NMCP to increase their responsibilities in IRS implementation campaign. However, due to NMCP's competing priorities and ongoing restructuring process during the spraying campaign, NMCP staff was not available to take on more responsibility of IRS activities as expected. NMCP managed the spray campaign's IEC activities with direct funding from PMI, but beyond these activities NMCP (including regional health team) was minimally available for IRS implementation and operations management at the district level.

Besides working with NMCP, AIRS Senegal coached regional environmental agents by co-conducting field inspections and helping with report writing. Updated checklists for the supervision were shared with SNH and NMCP for validation and AIRS Senegal continued to coach SNH supervisors on the use of smartphone. AIRS Senegal worked closely with SNH agents and DMO on data analysis in the field.

In 2015, DMO and DHMT were able to conduct the district micro-planning workshop with HPN and local authorities usually chaired by the prefect, the highest administrative authority in the district. During micro-planning, AIRS Senegal coached health post chief nurses to develop the spray calendar of health post catchment areas. AIRS Senegal also coached district agents in supervision using smartphone technology in order to build capacity in IRS implementing stages at the district level.

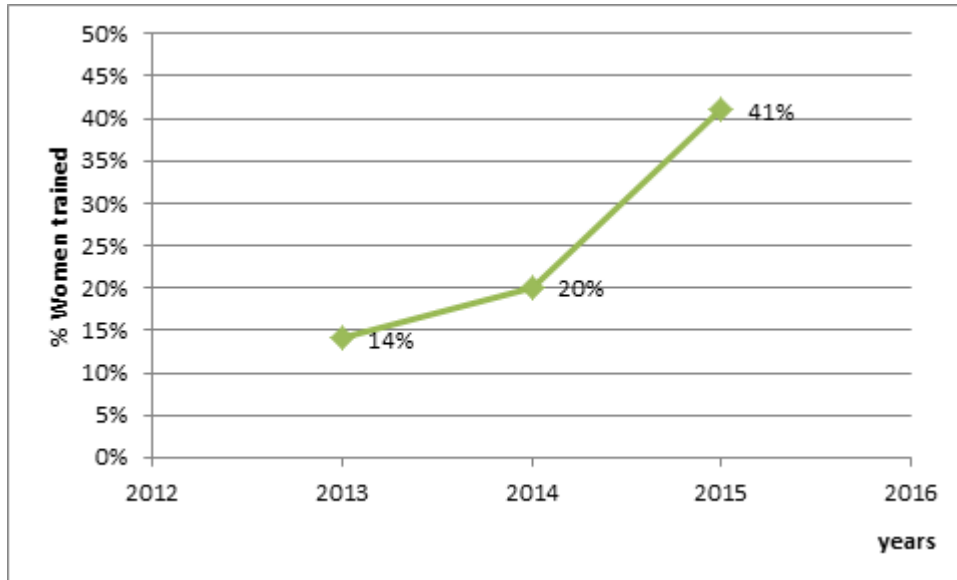
II. GENDER

AIRS Senegal's gender focal person participated in the PMI AIRS Project-wide gender training from March 23-25, 2015 in Kigali, Rwanda.

Following activities were accomplished:

- In April 2015, the focal person conducted the training of AIRS Senegal staff on a gender-focused approach to improve the participation of women on the PMI AIRS Project. Main steps were to clarify gender concepts (gender and sex), gender equality and equity, and to discuss gender inclusion barriers and solutions. In addition, the PMI AIRS Project's sexual harassment policy and guidelines, overall gender goals for the project, and the M&E aspects on gender work were also explained. A country gender operational plan was developed by the gender focal person and approved by the COP. In total, 17 PMI AIRS personnel were trained, including eight women.
- Gender training for 24 new SNH agents took place in Kaolack as a part of these agents' training on IRS (April 8-11, 2015). Note that SNH is a para-military corps with very few women recruited as hygiene officers. This training will hopefully be an advocacy opportunity for sensitizing higher-level government authorities to consider women's applications in the future.
- One session on gender training was included in the IRS Trainer's Orientation Workshop on May 4-5, 2015 in Kaolack. One gender training session was included in the SOPs and auxiliary training that took place in Koungheul and Koumpentoum May 7-11, 2015 and in Nioro and Malem Hoddar May 13-17, 2015. Overall, 2,110 people were trained to deliver IRS including mobilizers of which 41% were women compared to 20% in 2014. In 2015, women in supervisory roles represented 21% of supervisors.
- AIRS Senegal attempted to increase women's representation in all job roles for the 2015 spray campaign. Several advocacy activities were conducted locally such as encouraging women's applications for all open positions during the national planning and micro-planning workshops. More specifically, AIRS Senegal's Operations Manager has been designated as gender focal person among the project staff. She has established a collaborative relationship with other gender focal persons (NMCP and USAID) and has plans to share documentation on USAID gender policies.
- New innovations include "Badjénou gokh" (voluntary women in the community) and involving women's associations in the all district meetings concerning IRS activities.
- All operational sites displayed a poster of the PMI AIRS Project's Sexual Harassment Guidelines as well as signs indicating women's toilets and dressing rooms to better protect women.
- Sending of SMS on gender during Nioro's second campaign.
- In Nioro's second campaign, four women hygiene agents were trained and integrated as assistant supervisors.

FIGURE 3. WOMEN TRAINED EVOLUTION FROM 2013 TO 2015 IN IRS OPERATIONS



From 2013 to 2014, the rate of women participating in IRS' campaign increased from 14% to 20%, which did not include IEC mobilizers. In 2015, women participation increased to 41% taking into consideration IEC mobilizers. These results show the efforts made by PMI AIRS to promote gender equality in IRS.

12. MARKINGS AND ZIP TIES

In 2015, AIRS Senegal opted for the discontinuation of IRS Card use and the implementation of a new tracking system for households. Two tools were proposed: chalk marking and zip ties.

Chalk marking has been done previously, but not consistently implemented and well supervised. In 2015, instructions were issued and SOPs were trained on how to mark households. The innovation this year was the use of zip ties. Both chalk marking and zip ties objectives were to identify sprayed or not sprayed structure, refusal cases and also provide evidence of SOP passage.

SOPs including team leaders and site managers were trained on zip use during the last day of training. During supervisors' orientation, local SNH supervisors were also exposed to how to use the zips and instructed on making sure that zips are attached to the right place by SOPs. Black zip-ties were attached to structures that had been fully sprayed, white zip-ties were used to identify structures that would need to be revisited during mop-up, and red zip-ties were used to identify structures that were not sprayed and categorical refusal cases. In overall, SOPs successfully attached zips as instructed.

However, some challenges with the implementation of this innovation were noted in the field. Firstly, the zip-ties were too thin and consequently it was very difficult to identify them from far away specially the black ones. Secondly, some spray teams had problems to attach them in urban areas because the kinds of structures, door and windows are metallic. However, if SOP had problems to attach them on structures, then they would attach them on the door of the concessions.

Chalk marking was correctly done by SOPs without major issues. Marks were done at the left top side of the door of the structure. Few challenges were observed that included marking on the structures built with straw. In that case SOPs were instructed to mark on piece of paper to be attached to the structure.

Mainly recommendations about zip ties if we plan to use them in the future is to first increase size in order to have enough space to write important information like SOP ID, date of spray and second using white color zip ties for structures sprayed.

The audit of the use of zip ties was conducted during the second campaign in Nioro. It was performed by SNH supervisors and the AIRS/Nioro Coordinator using the verification form. In 1,104 structures visited, 25% were identified without zip ties. The main reason for non-attachment is that spray operators and/or team leaders forgot about attaching the zip ties.

13. LESSONS LEARNED

- Following the needs assessment, quantification of insecticide, and distribution schedule, AIRS Senegal purchased sufficient quantities of equipment and insecticide in a timely manner and distributed them to all sites two weeks prior to the start of spray operations. Improved inventory management made it possible to avoid stock-outs. This approach to pesticide stock management was enhanced and reinforced during the trainings for the 2015 campaign.
- The presence of AIRS Senegal teams in the field for supervision during the entire campaign – with systematic use of the supervision tools – for spray operations monitoring and on-site problem solving greatly improved SOPs' performance.
- Weekly meetings of NMCP and SNH IRS focal points with AIRS Senegal's Operations Manager contributed to better IRS implementation and coordination of workshops and training activities.
- Eleven of 21 IRS sites were provided to the project free of charge as a means of community participation and ownership. In addition, some local authorities supported part of charges for sites rehabilitation. In 2014, five out of 35 sites were provided free of charge by the community.
- Training district health workers on the implementation of an IRS project and transferring competencies to government agents contributed to the local long-term sustainability of IRS.
- Availability of a DHMT member as an IRS focal point for the campaign allowed better monitoring of spray operations by the district and consequently performance improvement (e.g. in Koumpentoum, Kounghoul, and Niore where debriefing meetings were coordinated by the DHMT).
- Settlement campsites and MSP pilot sites contributed to reducing travel time for spray teams, which consequently led to increasing performance.
- The use of smartphones for collecting and transmitting EC data allowed COP, Operations Manager, ECO, ECM, and technical coordinators to be much more aware of site conditions than in the past.
- Putting in place the SPTS tool at each site allowed a visual daily monitoring of SOP performance and of insecticide use among the SOPs themselves and their supervisors at all levels. In addition, the tool created healthy competition among spray teams between sites in the same place.
- Site managers and team leaders were available the day before the start of the campaign to prepare material, coding, and packaging for each SOP in order to avoid any start-up delays on the first day.
- In 2015, the use of the Error Eliminator form was required for all supervisors and extended to all data collected at site level.
- Using smartphones for spray supervision allowed teams to immediately address any shortcomings reported by supervisors. Actors on the ground could receive supervision reports at the same time as managers for anticipating shortcomings.
- Sufficient quantity of activated carbon is needed for mobile soak pit implementation.
- The inclusion of local authorities in IRS operations planning, supervision, and end of spraying evaluation contributed to the success of mobilization and IRS acceptance by the population.
- Lessons learned from the first campaign were used to improve activities during the Niore campaign in September. The use of the smartphones for supervision substantially improved the SMS job aids.

I 4. RECOMMENDATIONS

- Highlight what was done this year in terms of community participation in order to better engage communities via local governments (IRS to be included in local government budgets).
- Be more specific with contract terms for vehicle owners in regards to vehicle type and working hours.
- Incorporate community contributions into the financial planning of district IRS activities.
- Increase size of zip ties in order to have enough space to write important information like SOP ID, date of spray
- Use white color zip ties for structures sprayed
- Organize IEC mobilizers in a way that those with relatively higher education level help others with lower or no education to record data.
- Better monitor IEC plan in all districts.
- Revise supervision checklist in reduced format taking into consideration most relevant issues.
- Share information from the implementation with local communities (planning, cases of refusal and other relevant information).
- In a dynamic of sustainability and ownership of the strategy:
 - Share results and approaches with the regions, the Commons, Members, etc.;
 - Hold workshops / meetings for innovative financing;
 - Draw upon volunteers of the Red Cross;
 - Consider the views of local communities.
- Organize a meeting between DEEC and NMCP to discuss how to harmonize and alleviate some administrative issues to ensure timely authorization for insecticide importation as well as disposal of waste after IRS campaign
- Consider the findings from the satisfaction surveys about the socio-anthropological and socio-economic aspects of an IRS campaign

ANNEX A. AIRS SENEGAL

PROCUREMENT AND POST-SPRAY STOCK BALANCE

Procurement									
Item	Qty	Dispatching			Balance in Warehouses				Total Balance
		Koungheul	Koumpentoum	Nioro	Koungheul	Koumpentoum	Nioro	Kaolack	
Towels	1,200	360	324	501	14	83	0	0	97
Socks	0	0	0	0	59	75	240	143	517
Soap 300g	300	50	50	76	29	90	0	211	330
Soap 125g	1,928	0	400	790	00	00	00	7389	7383
Bleach	73	27	24	39	0	1	8	10	19
Liquid Detergent	45	27	24	39	0	4	0	11	15
Powder Soap	4,950	2,940	2,640	4,220	0	560	1,320	109	1,989
Grease Pot 1kg	9	18	16	26	17	15	21	0	53
Adhesive Tape LM	160	20	20	20	0	7	11	0	18
Laundry Brush	66	19	18	37	48	18	37	5	108
Flat Wrench	70	20	18	28	20	18	28	172	238
Universal Pliers	49	20	18	24	20	18	24	2	64
Gas Tongs	70	20	18	28	20	18	28	106	172
Plastic Apron	90	30	24	36	30	30	53	29	142
Toothbrush	300	18	27	177	18	46	107	66	237
Plastic Sheet Rolls	20	5	3	9	0	0	0	25	25
Ceiling Fans	41	9	14	18	9	14	18	7	48
Adhesive Paper	40	15	10	12	0	0	0	0	0
Measuring Tape	26	6	8	10	6	8	13	0	27
Markers	184	25	30	30	0	0	0	0	0
Inner Folder	600	200	200	200	0	0	0	0	0

Procurement									
Item	Qty	Dispatching			Balance in Warehouses				Total Balance
		Koungheul	Koumpentoum	Nioro	Koungheul	Koumpentoum	Nioro	Kaolack	
Flap Folder	650	200	160	240	0	0	0	0	0
Black Pencil	796	350	350	96	12	0	278	0	290
Eraser	796	247	0	325	27	0	396	409	832
Note Pad	900	247	204	325	0	0	29	135	164
Calculator		52	40	29	53	50	59	16	178
Log Book	55	7	7	10	0	0	0	1	1
Ruler 30 cm	36	9	10	13	9	10	13	50	82
Clip A4	1,280	291	259	464	269	247	464	244	1,224
Chalk Box (color)	52	10	10	22	0	0	0	2	2
Chalk Box (white)	52	10	10	22	0	0	0	0	0
Stapler	62	22	20	30	47	23	61	4	135
Pencil Sharpener	400	712	752	1,392	0	0	129	0	129
Shower Cap	99	25	30	35	0	0	0	0	0
Scissors	40	12	11	16	18	17	25	5	65

International Procurement									
Face Shield	1,280	103	113	50	79	201	192	999	1,471
Glove	2,556	467	383	618	204	328	23	834	1,389
Nose Mask w/Filter	27,878	7,207	5,427	9,240	3,500	3,541	3090	5120	15,251
Organophosphate	48,671	12,480	12,324	16,435	0	0	0	29,361	29,361

ANNEX B. PEOPLE TRAINED FOR 2015 CAMPAIGN

Categories of people trained	Training for IRS implementation																		Other trainings		TOTAL		TOTAL GENERAL
	Mobilisation		Trainers' Training		Spray Operators' Training		Data Entry		Logistics & Finance Training		Technical Maintenance		IRS related poisoning management		PPE Cleaning		Fire Safety		Transport Safety		M	F	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F			
PNLP/MOH/regional			16	5																	16	5	21
SLAP			1	0																	1	0	1
DEEC/DREEC			3	1																	3	1	4
Nurses/Midwives													27	19							27	19	46
SNH Supervisor of Spray Operators			51	4																	51	4	55
Mobilizers	52	81																			52	81	133
Spray Operator					391	148															391	148	539
Substitutes Operators					66	25															66	25	91
Operational Site Manager					23	4															23	4	27
Team Leader					84	25															84	25	109
Data Entry Clerks							9	8													9	8	17
Storekeepers									22	9											22	9	31

Finances/Logistics Assistants										1	4											1	4	5
Maintenance Technicians											29	1										29	1	30
Washers															0	58						0	58	58
Drivers																		73	0			73	0	73
Puiseuses																	0	5				0	5	5
Guards																42	0					42	0	42
TOTAL M/F	52	81	71	10	564	202	9	8	23	13	29	1	27	19	0	58	42	5	73	0	890	397	1,287	
TOTAL/ Training	133		81		766		17		36		30		46		58		47		73		1,287			

ANNEX C: INDICATOR MATRIX WITH YEAR 1 RESULTS

Last Updated: 22 September 2015

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 I: Establish cost-effective supply chain mechanisms and execute logistical plans								
I.1 Procurement								
I.1.1 Number and percentage of insecticide procurements that had a pre-shipment QA/QC test at least 60 days prior to spray campaign	<i>Data source:</i> Project records – insecticide procurements <i>Reporting frequency:</i> Each spray campaign	By Spray Campaign	I; 100%	I;100%	100%		100%	
I.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	<i>Data source:</i> Project records – international procurements <i>Reporting frequency:</i> Each spray campaign	By Spray Campaign	I; 100%	I;100%	100%		100%	
I.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	<i>Data source:</i> Project records <i>Reporting frequency:</i> Each spray campaign	By Spray Campaign	I; 100%	I;100%	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	<i>Data source:</i> Project records <i>Reporting frequency:</i> Each spray campaign	By Spray Campaign	I; 100%	I; 100%	100%		100%	
1.1.5 Successfully completed spray operations without an insecticide stock-out	<i>Data source:</i> Project records <i>Reporting frequency:</i> Each spray campaign	By Spray Campaign	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	<i>Data source:</i> Project records <i>Reporting frequency:</i> Each spray campaign	By Spray Campaign	Completed	Not completed ⁴	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	<i>Data source:</i> Training records <i>Reporting frequency:</i> Each spray campaign	By Spray Campaign By Gender	35 ⁵ ; 100% M: 28 F: 7	33 ⁶ M: 22 F: 11	TBD; 100%		TBD; 100%	

⁴ Delay receiving DEEC authorization and longer customs procedures than usual

⁵ 3 logistics assistants, 28 warehouse site managers, 3 district warehouses managers, 1 central warehouse manager

⁶ 2 logistics assistants, 27 warehouse site managers, 3 district warehouses managers, 1 central warehouse manager

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
1.3.2 Number and percentage of base stores where physical inventories are verified by up-to-date stock records	<i>Data source:</i> Project records <i>Reporting frequency:</i> Each spray campaign	By Spray Campaign	25 ⁷ ; 100%	31 ⁸	TBD; 100%		TBD; 100%	
1.3.3 Submit up-to-date inventory records 30 days after the end of each spray campaign	<i>Data source:</i> Project records <i>Reporting frequency:</i> Each spray campaign	By Spray Campaign	Completed	Completed	Completed		Completed	

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	<i>Data source:</i> Project records <i>Reporting frequency:</i> Annually	By Spray Campaign	Completed	Completed	Completed		Completed	
2.1.2 Percentage reduction in project operational expenses per structure from the previous year, excluding insecticide costs.	<i>Data source:</i> Project financial records <i>Reporting frequency:</i> Annually	By Spray Campaign	5%	10% ⁹	5%		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	<i>Data source:</i> Project records –	By Spray	Completed	Completed	Completed		Completed	
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⁷ 21 warehouses sites, 3 district warehouses, 1 central warehouse

⁸ 27 warehouses sites, 3 district warehouses, 1 central warehouse

⁹ cost comparison 2014 vs. 2015 : reducing costs per spraying day through concessions sprayed; structures sprayed; rooms sprayed, person protected and the number of vehicles used

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	
submitted on time based on schedule agreed upon with the-PMI COR team	submitted SEAs/ letter reports Reporting frequency: Each spray campaign	Campaign							
2.2.2 Number of spray personnel trained in environmental compliance and personal safety standards in IRS implementation	Data source: Project records – Training reports Reporting frequency: Each spray season	By Spray Campaign By Gender	1,000 ¹⁰ M: 730 F: 270	1000 ¹¹ M:730 F: 270	TBD		TBD		
2.2.3 Number of health workers receiving insecticide poisoning case management training	Data source: Project records – Training reports Reporting frequency: Each spray season	By Spray Campaign By Gender	46 ¹² M:27 F: 19	46 ¹³ M:27 F: 19	TBD		TBD		
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		0		
2.2.5 Number and percentage of soak pits and storehouses	Data source: Project records – Reports submitted by district	By Spray Campaign	55 ¹⁴ ; 100%	55 ¹⁵ ; 100%	TBD; 100%		TBD; 100%		

¹⁰539 spray operators, 91 substitute operators; 27 operational site managers; 109 team leaders; 31 storekeepers; 30 pump technicians; 58 washers; 73 drivers; 42 guards.

¹¹ 539 spray operators 91 substitute operators; 27 operational site managers; 109 team leaders; 31 storekeepers; 30 pump technicians; 58 washers; 73 drivers; 42 guards

¹², 46 ICP

¹³ 46 ICP

¹⁴ 23 soak pits, 32 warehouse

¹⁵ 23 soak pits, 32 warehouse

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
inspected and approved prior to spraying	environmental officers Reporting frequency: Each spray season	By Soak Pit By Storehouse	23 soak pits 32 warehouses	23 soak pits 32 warehouse				
2.3 Conduct Communications Activities and Community Mobilization¹⁶								
2.3.1 Number of radio spots and talk shows aired	Data source: Project records Reporting frequency: Per spray campaign	By Spray Campaign	NA	NA	TBD		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 message(s)	NA	NA	TBD		TBD	
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	NA	NA	TBD		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	By Spray Campaign	136,473	133,252	TBD		TBD	

¹⁶ This section is managed by NMCP

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
	spray campaign							
2.4.2 Number of structures sprayed with IRS	Data source: Daily Spray Operator Forms Reporting frequency: Daily per spray campaign	By Spray Campaign	116,002	130,170	TBD		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%	97.7%	85%		85%	
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	371,296 M: 183,517 F: 187,779 Pregnant women: 8,778 children<5: 71,171	514,833 M: 254,643 F: 260,190 Pregnant women: 9,936 children<5: 89,574	TBD		TBD	TBD
Component 3: Ongoing Monitoring and Evaluation and Quality Control Measures								
3.1 Submit PMI-approved M&E plan to PMI-SENEGAL for approval	Data source: Project records Reporting frequency: Semi-annual	By Spray Campaign	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	NA	NA	Completed		Completed	

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 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	23 ¹⁷ 15 guidelines 8 checklists	25 ¹⁸ 18 guidelines 7 checklists	TBD		TBD	
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	2	2	TBD		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 ⁱ	3 ¹⁹	2 ²⁰	TBD		TBD	

¹⁷ 15 guidelines, 8 check-lists

¹⁸ 18 guidelines; 7 checklists

¹⁹ | Hot spots strategy, | Evaluation of hot spots strategy, | Lessons learned from IRS 2014

²⁰ | Hot spots strategy, | Lessons learned from IRS 2014

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
4.4 Number of enterprises engaged through public-private partnerships	Data source: Project records – Activity reports Reporting frequency: Semi-annually	By Spray Campaign	4 ²¹	4 ²²	TBD		TBD	

Component 5: Contribute to the collection and analysis of Routine entomological and epidemiological data²³

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	NA	NA	TBD		TBD	
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	NA	NA	TBD		TBD	

²¹ Anti Poison Center, SOCOCIM, SODIAPLAST, E-déchets,

²² Anti Poison Center, SOCOCIM, SODIAPLAST, E-déchets,

²³ This section is managed by UCAD (University Cheikh Anta Diop)

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
5.1.3 Number and percentage of entomological monitoring sites measuring at least one secondary PMI indicator	Data source: Entomological reports Reporting frequency: Annually	By Spray Campaign	NA	NA	TBD		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	NA	NA	TBD		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	NA	NA	TBD		TBD	
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	NA	NA	TBD		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 By Type of Insecticide	NA	NA	TBD		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
5.2 Support Epidemiological Malaria Data Collection and Analysis								
5.2.1 Collect routine epidemiological data	Data source: <i>Project Reports</i> Reporting Frequency: Annually	By Spray Campaign	NA	NA	TBD		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	24 ²⁴	24 ²⁵	TBD		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-annually	By Spray Campaign By Spray Campaign	896 ²⁶ M: 767 F: 131 14,6%	893 ²⁷ M: 662 F: 231 26%	TBD		TBD	

²⁴ 12 IRS health posts, 12 Non-IRS health posts

²⁵ 12 IRS health posts, 12 Non-IRS health posts

²⁶ 24 Regional health agents, 42 SNH, 539 spray operators, 109 substitutes, 109 team leaders, 27 site managers, 46 nurses

²⁷ 21 Regional health agents, ISLAP, 4 DREEC/DEEC, 55 SNH, 539 spray operator, 91 substitutes, 109 team leader, 27 site manager, 46 nurses,

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	
		By Gender Percentage of Women Trained							
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	1,394 M: 1,296 F: 98 7.0%	1287 M: 890 F: 397 31%	TBD		TBD		
6.1.3 Number of women recruited for IRS employment	Data source: Project records – Recruitment reports reports Reporting frequency: Semi-annually	By Country By Percentage of women recruited	186 ²⁸ 21%	287 ²⁹ 30%	TBD		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	42 ³⁰ M: 40 F: 2 4.7%	42 ³¹ M: 45 F: 0 0%	TBD		TBD		

²⁸ Estimated number of women recruited based on percentage of women recruited last year: 21% of 885

²⁹ 148 spray operator, 25 team leader, 4 site managers, 9 storekeeper, 58 washers, 5 water suppliers, 8 data clerks, 4 logistics + financial assistants managers, 25 cleaners, 1 pump technician

³⁰ 42 SNH agents

³¹ 42 SNH agents

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
6.1.5 Total number of people hired to support IRS in target districts	Data source: Project records – Contracts signed Reporting frequency: <i>Semi-annually</i>	By Spray Campaign Gender Percentage of women hired	1,077 ³² M: 851 F: 226 21%	961 ³³ M: 674 F: 287 30%	TBD		TBD	
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)	Data source: Project records – Contracts signed Reporting frequency: <i>Semi-annually</i>	By Spray Campaign Percentage of women hired	14 ³⁴ 9%	45 ³⁵ 21%	TBD		TBD	
6.1.7 Number of staff (permanent and seasonal) who have completed gender awareness training	Data source: Project records – Training reports Reporting frequency: <i>Semi-annually</i>	By Spray Campaign Gender Percentage of women hired	19 ³⁶ M: 11 F: 8 42%	17 ³⁷ M: 9 F: 8 47%	TBD		TBD	

³² people to be recruited in 2015

³³ 539 spray operator, 109 team leader, 27 site manager, 31 storekeeper, 58 washers, 42 guards, 73 drivers, 5 water suppliers, 17 dataclerks, 5 logistics +financials assistants, 25 cleaners, 30 pump technicians

³⁴ Estimated number of women hired in supervisory roles based on percentage of women hired last year : 9% of 153(87 team leader, 21 site manager, 17 dataclerks, 25 storekeepers, 3 logistics assistants)

³⁵ 25Team leader, 4 site managers, 9storekeepers, 1pump technician, 2dataclerk supervisors, 4 logistics+financials assistants,

³⁶ Permanent staff Dakar and district

³⁷ 1 COP, 1 TM, 1 IEC Officer, 1 Proc Officer., 1 driver, 1 Admin Asst., 1 Accountant, 1 Log coord., 1 ECO, 1 M&E Mgr, 1 database Mgr, 4 districts coord., 1 IT Specialist, 1 OM

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
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 Trained	24 ³⁸ M: 19 F: 5 20.8%	21 ³⁹ M: 15 F: 6 28.5%	TBD		TBD	
6.2. 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	
6.2.3 Senegal government implements at least one aspect of the IRS program independently.	Data source: Project records – MOUs Reporting frequency: Semi-annually	By Spray Campaign	NA	NA	TBD		TBD	

³⁸ 7SNH (3BRH, 4 SBRH), 3DREEC, 6 (3BREIPS, 3MCR) , 8 Districts (MDO, IRS focal point)

³⁹ 7SNH (3BRH, 4 SBRH), 3DREEC, 3BREIPS , 8 Districts (MDO, IRS focal point)

ANNEX D: ENVIRONMENTAL MITIGATION AND MONITORING REPORT (EMMR)

The Environmental Mitigation and Monitoring Plan (EMMP), submitted annually at the beginning of the reporting year with work plans

Implementing partners will use the EMMP to describe the specific actions they will undertake under each category of activity when screening reveals potential environmental threats as outlined in Section 3 of this IEE. In these cases, mitigation will be undertaken as described in Section 4. The EMMP also identifies the person responsible for monitoring compliance with mitigation and the indicator, method, and frequency of monitoring.

The Environmental Mitigation and Monitoring Report (EMMR), submitted annually with the End of Spray Report (EOSR)

This form reports on the results of applying the mitigation measures described in the EMMP and identifies outstanding issues with respect to required conditions. In some cases, digital photos will be the best way to document mitigation and should be included.

The EMMR must be completed by the Implementing Partner. The EMMRs are reviewed and approved by the COR and the BEO (and/or MEO, as appropriate). Any sub-awards, sub-grants, and sub-activities must incorporate provisions stipulating a) the completion of an annual environmental monitoring report and b) that activities to be undertaken will be within the scope of the environmental determinations and recommendations of this IEE. This includes assurances that any mitigating measures required for those activities be followed.

Mitigation Measure	Status of Mitigation Measures	Outstanding issues relating to required conditions	Remarks
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<p>1a. Pre-contract inspection and certification of vehicles used for pesticide or spray team transport.</p>	<p>During this pre-contract inspection, vehicles with no supporting documents covering the period were identified. Vehicles presented during the inspection were used and any changes were reported and a new inspection done before use.</p> <p>The total number of vehicles inspected and validated was 73 vehicles which have been used for two campaigns and this was done prior to the signing of contracts.</p>	<p>The inspection of vehicles being simultaneously done in all districts, ECO could not be present everywhere. The SMT (Senior Management Team) and district coordinators helped by respecting the standards. These vehicles were used during campaign.</p>	<p>The Districts coordinators have all received comprehensive training on environmental safety measures.</p>
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<p>1b. Driver training</p>	<p>Driver were trained according to FAO recommendations</p> <p>training completion</p> <p>Cautious driving while transporting chemicals and spray operators (speed limit to 70km/h)</p> <p>In case of a driver change, the replacement was imperatively trained: 2 drivers were replaced during campaign and they received training before starting.Overall 76 drivers were trained</p> <p>Before signing contract all conditions to respect were reading to contractors</p>	<p>Vehicle owners want to attend the training as well as drivers and sometimes they raise questions that have nothing to do with the objectives of this orientation.</p> <p>The drivers are usually illiterate so they do not take notes during orientation.</p>	<p>Make it clear to vehicle owners that this orientation does not concern administrative or financial aspects but rather technical related to their job.</p> <p>Distribute brochures with pictograms for a better assimilation of recommendations</p>
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<p>1c. Cell phone, personal protective equipment (PPE) and spill kits on board during pesticide transportation.</p>	<p>Providing telephone and PPE for all drivers could cause problems during the campaign; we assumed that in Senegal telephone is widely used by all adult. Driver owning a phone was part of selection criteria</p> <p>How many morning mobilization and spray operator transportation vehicle inspections were conducted? How many times during these inspections did the inspectors indicate that the driver didn't have a cell phone and PPE, or vehicle didn't have spill kits on board when pesticides were being transported?</p> <p>Out of 723 inspections, 141 times drivers do not have their PPE or phone</p> <p>For the second campaign of 103 inspection only 02 times the driver did not have his phone in his possession</p>	<p>We do not provide PPE to all drivers but only to drivers who transport the pesticide and this PPE will be worn only in case of a spill. Wearing boots make driving difficult because the drivers do not usually wear them.</p> <p>Some supervisors do not phrase well the questions to the drivers because most drivers are not educated. Their questions must be very clear so that the drivers can give correct answers.</p> <p>Before the second campaign orientation was made by ECO for supervisors, site managers and team leaders to harmonize the understanding of the checklist contents and to share the results of the supervision of the previous campaign to raise awareness about the impact of their mistakes.</p>	<p>Keep the current format</p> <p>Drivers are equipped with masks, gloves, and boots for the loading and unloading as well as the transport of the pesticide, but they are not allowed to handle the pesticides and contaminated materials. Note that all drivers have phone (which was required during the selection). We will identify and improve the training on specific issues as appropriate.</p>
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<p>1d. Initial and 30-day pregnancy testing for female candidates for jobs with potential pesticide contact.</p>	<p>For the 2015 campaign, the spraying was done in 20 days for the first campaign and 10 days for the second campaign in Nioro. As recruitment was done one week before the starting a second testing was done at the last week of the campaign.</p> <p>Number of the first pregnancy: 271 at reproductive age underwent pre-campaign pregnancy tests that proved negative.</p> <p>Number of the second pregnancy test: 163 tests, 02 cases of pregnant were positive.</p>		<p>The 2 ladies were relocated as office assistants.</p>
<p>1e. Health fitness testing for all operators</p>	<p>Health fitness testing has been done before the training of the operators: 761 seasonal personnel (including 230 females) were examined as part of the pre-IRS medical check-up</p>		

<p>1f. Procurement of, distribution to, and training on the use of PPE for all workers with potential pesticide contact.</p>	<p>All potential workers in contact with the pesticides were trained and protected with appropriate PPE except for drivers who will be equipped with PPE, unless there will be a spilled.</p> <p>-606 trained operational personnel for the PPE used: 429 sprayers, 21 site managers, 87 team leaders, and 69 substitute sprayers.</p> <p>In addition 21 maintenance technicians, 57 washers, 28 storekeepers, 23 SNH agents, and one NMCP staff were trained.</p>		
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1g. Training on mixing pesticides and the proper use and maintenance of spray pumps.

The presentation of pumps to be used and the demonstration on the procedure to be followed for the mixture were included in the operators training modules. The operators have been trained on the progressive rinsing system of equipment and minor breakdown repairs.

606 trained operational personnel for the PPE used include : 429 sprayers, 21 site managers, 87 team leaders, and 69 substitute sprayers, 21 maintenance technicians, 4 environmental officers (DEEC and DREEC), 23 SNH agents, and one NMCP staff

<p>1h. Provision of adequate facilities and supplies for end-of-day cleanup,</p>	<p>Wide availability on work coats and washing gloves</p> <p>All other supplies were in place for rinsing. In all, 418 inspections carried out,</p> <ul style="list-style-type: none"> - 145 SOP were eating or drinking (may be also with straws) - 19 Times there was no water - In 114 times the pumps Goizper are not hung for drying in Niore and Koumpentoum - 3 times the pumps are not hung for drying because the support was dislocated 	<ul style="list-style-type: none"> - The question should have been clearly formulated: do the OPs eat or drink without straws during spraying? - There is always water in the rinse barrels but may be that drums are not always full (recorded as no water): the washers must fill up the barrels after soaking clothes. - The manufacturer recommended not drying them in the sun to the risk of damaging the pump; the constitution of the pump allows evacuating residual water in the pump. 	
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<p>1i. Enforce clean-up procedures.</p>	<p>Enforce clean-up procedures during the training especially this year since the applicators themselves washed their pump.</p> <p>The applicators were supervised by the team leaders and local supervisors during the rinsing phase.</p> <p>In all, 418 inspections carried out in observing rinsing, 133 were not supervised by team leaders</p>	<p>-The supervision of the rinsing phase by the team leaders was not systematic as at that time they were revising and finalizing data collected by spray operators.</p>	<p>The operations department suggests transferring this responsibility to supervisors and maintenance technicians.</p> <p>Both SNH local supervisors and team leaders are responsible and must closely be supervising SOP during progressive rinsing of their pumps.</p>
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<p>2a. IEC campaigns to inform homeowners of responsibilities and precautions.</p>	<p>Relays were trained on key messages for information and insufficient time to enable them to prepare and insist on compliance with security measures.</p> <p>Out of the 668 inspections on the preparation of cases beneficiaries are:</p> <ul style="list-style-type: none"> -54 Cases where animals are not kept outside spraying environment --33 Cases spraying with sick or elderly people inside the rooms - 621 instances with missing flashlights out of 826 inspections 	<p>The information transmitted by the mobilizers to the recipients was generally limited to the day of passage of spray operators.</p> <p>-It is difficult to keep the animals because in some cases they are living under the same roof than the beneficiaries. Animals must be kept out of the spraying environment.</p> <p>-During IRS operations except the SOP and may be the supervisor; no one is inside the room. Rooms where the sick and / or old people cannot displaced are not treated</p> <p>-Flashlights will be provided for the next campaign</p>	<p>Mobilizers must take time to well transmit the message related to the benefits of IRS and security measures taken to prevent some refusal cases.</p> <p>The question was not properly responded because there was no flashlight provided during the campaign.</p>
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<p>2b. Prohibition of spraying houses that are not properly prepared.</p>	<p>Ensure a better awareness of the beneficiaries on the preparation of rooms (carry outside belonging or putting them in the center of the room)</p> <p>Respect scheduled dates of a given village - IEC mobilizer and SOP will coordinate activities</p> <p>Out of the 668 inspections on the structures preparation we have: -54 Cases where animals are not kept in safe place -20 refusal cases (3%)</p>	<p>- It is difficult to keep the animals because in some cases they are living under the same roof than beneficiary they must be kept outside spraying areas. Some cases of refusal are programmed for mopping.</p>	
<p>2c. Two-hour exclusion from house after spraying</p>	<p>This is part of the informed messages by the relays and refresh by SOP. The supervision sheet provides a questionnaire in this sense to see whether the message has gotten through Only 4 cases out of the 668 inspections do not follow the protocol.</p>		

<p>2d. Instruct homeowners to wash itchy skin and go to health clinic if symptoms do not subside.</p>	<p>This is part of the informed messages by the relays and refresh by SOP. The supervision sheet provides a questionnaire in this sense to see whether the message has gotten through Out of the 668 inspections, 16 say they are not aware of the procedures in case of discomfort.</p>		
<p>3a. Indoor spraying only.</p>	<p>This aspect was highlighted during the operators training.</p> <p>Only 5 cases of surface to be treated were untreated and 6 cases of surfaces not to be treated are sprayed out of 668 inspection forms.</p>		<p>The eaves are also to be sprayed.</p>

<p>3b. Training on proper spray technique</p>	<p>Training of trainers was carried out to ensure the teaching quality.</p> <p>Use of constant flow valves for all pumps was required.</p> <p>-6.3% Of cases (42/668) do not respect the wall nozzle distance and 3,3% (22/668) do not respect overlapping</p>		<p>Many emphasize on the spray speed to ensure quality</p>
<p>3c. Maintenance of pumps</p>	<p>Preventive maintenance is planned and during the campaigns, maintenance technicians assured the functionality of pumps.</p> <p>-Out of 668 inspections, 56 times the pumps were leaking</p>	<p>Lack of will for some spray operators to wash their own pump.</p> <p>Strengthen washing pumps by SOP and rigorous maintenance of the pumps by technicians as needed.</p>	<p>Pumps must be strictly managed by the spray operators: each applicator should be empowered to its pump to avoid certain technical problems.</p> <p>Sign a commitment to each spray operator relative to the pumps management.</p>
<p>4a. Choose sites for disposal of liquid wastes according to PMI BMPs.</p>	<p>All sites were provided with soak pits for the disposal of liquid waste. Camping sites have MSP for washing pumps, masks, gloves and helmet.</p>		

4b. Construct soak pits with charcoal to adsorb pesticide from rinse water.	This principle was used for the construction of soak pits.		
4c. Maintain soak pits as necessary during season.	Soak pits were covered by a layer of cement after the campaign		
4d. Inspection and certification of solid waste disposal sites before spray campaign.	A cement factory (SOCOCIM), approved by the environment department (DEEC), agreed to the incineration of solid waste from the campaign. A plastic materials recycling factory (SODIAPLAST) agreed to collect plastic waste for recycling.		
4e. Monitoring waste storage and management during campaign.	<p>The waste was regularly inventoried and sent to the central level before disposal at the end of IRS campaign.</p> <p>14036 used masks, 6279 empty Ficam sachets and 32,925 empty Actellic bottles were packaged and transferred to the central warehouse</p>		
4f. Monitoring disposal procedures post-campaign.	Waste disposal is done under the supervision of the environment officers from the DEEC and Abt ECO.	Repeat the same procedure is very restrictive for each year.	An agreement with the targeted partners must be tied up during the entire project.

5a. Maintain records of all pesticide receipts, issuance, and return of empty sachets/bottles.	An insecticide daily tracking sheet is used by each storekeeper. Team leaders have been required to return all the bags / empty bottles at the end of the day.		
5b. Reconciliation of number of houses sprayed vs. number of sachets/bottles used.	The spray performance displayed at each site allowed a daily tracking of the applicators performance and the use of the insecticide.		
5c. Visual examination of houses sprayed to confirm pesticide application.	A plastic zip tie was displayed on eligible structures walls to identify those treated. Applicators used chalk and zip tie to mark the treated structures.		
5d. Perform physical inventory counts during the spray season.	An inventory is scheduled every 15 days in all stores sites. An inventory was carried out every 15 days by site storekeeper and the assistant logistics coordinator.		