



PRESIDENT'S MALARIA INITIATIVE



INDOOR RESIDUAL SPRAYING FOR MALARIA CONTROL

Benin Spraying Performance Report

Indoor Residual Spraying (IRS 2) Task Order One

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Acronyms

ABE	Benin Environmental Agency (Agence Béninoise pour L'Environnement)
ACT	artemisinin-based combination therapy
CA	Crown Agents
CD	compact disc
CFR	Code of Federal Regulations
CHP	chief of health post
COP	chief of party
CREC	Entomologic Research Center of Cotonou (Centre de Recherche Entomologique de Cotonou)
DAGRI	Directorate of Agriculture
DDEPN	Regional Directorate for the Environment and Natural Protection (Direction Départementale de l'Environnement et de la Protection de la Nature)
DDS	Regional Directorate for Health (Direction Départementale de la Santé)
DHAB	National Directorate of Hygiene (Direction de l'Hygiène et de l'Assainissement de Base)
DQA	Data Quality Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
FAO	Food and Agriculture Organization of the United Nations
FY	fiscal year
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GOB	Government of Benin
IEC	information, education, and communication
IPTp	intermittent preventive treatment for malaria in pregnancy
IRS	indoor residual spraying (pulvérisation intra domiciliaire)
ITN	insecticide-treated net
LLITN	long-lasting insecticide-treated net
M&E	monitoring and evaluation
MOAEP	Ministry of Agriculture and Fishery (Ministere de l'Agriculture, de l'Elevage et de la Pêche)
MOENP	Ministry of Environment and Natural Protection
MOH	Ministry of Health
NMCP	National Malaria Control Program (Programme National de Lutte contre le Paludisme)
PMI	United States President's Malaria Initiative
PPE	personal protective equipment
RBM	Roll Back Malaria
SEA	Supplemental Environmental Assessment
SESP	Service Monitoring Evaluation and Planification (SESP or Service Evaluation, Suivi et Planification)
SHAB	Service de l'Hygiène et de l'Assainissement de Base (Community Hygiene and Sanitation Service)
SP	Sulfadoxine-pyrimethamine
SPPS	Service of Promotion and Prevention for Health (SPPS or Service de Promotion et Protection de la Santé)
TOT	training of trainers

USAID
WB
WHO

United States Agency for International Development
World Bank
World Health Organization

Executive Summary

Malaria is one of the leading causes of morbidity and mortality in sub-Saharan Africa that negatively affect the social and economic development of these countries. The Government of Benin (GOB) and all of its key development partners (World Bank, United States President's Malaria Initiative, World Health Organization, Global Fund to Fight AIDS, Tuberculosis and Malaria) have identified malaria control as a top priority. In December 2006, the United States Agency for International Development (USAID) identified Benin as one of eight countries to receive funding during the third year of the United States President's Malaria Initiative (PMI). The goal of this initiative is to reduce malaria-related mortality by 50% in PMI countries, targeting the most vulnerable groups (children under five years of age and pregnant women) with preventive and therapeutic interventions. Indoor residual spraying (IRS) is one of PMI's major interventions in Benin and is included in the Benin National Strategic Plan 2006–2010, under axis 3: Vector control.

In 2007, USAID/PMI and the National Malaria Control Program (NMCP), in collaboration with the Entomologic Research Center of Cotonou (CREC, or Centre de Recherche Entomologique de Cotonou) identified different regions in Benin for IRS interventions. In 2008, the in-country PMI team and the NMCP agreed to focus IRS activities in four communes of Ouémé Region: Adjohoun, Akpro-Misséréké, Dangbo, and Sèmè-Kpodji. Ouémé is located within the humid zones of southeast Benin and was chosen for spraying most notably because it has the one of the highest incidences of malaria in the country.¹

RTI International, under contract with USAID for implementing IRS activities, was tasked to perform the following activities in Benin:

- Provide strategic, technical, management, and operational support for IRS activities in the four targeted communes.
- Build capacity in Benin to enable national partners to conduct IRS without the need for external assistance in the future.

Two IRS rounds were previously conducted in the four targeted communes. The first round in July–August 2008 sprayed 142,814 structures, with a coverage rate of 94.1%, and protected 521,738 people. The second round in March–April 2009 sprayed 156,233 structures, with a coverage rate of 99.4%, and protected 512,491 people. The third round began March 8, 2010, and ended April 28.

IRS activities were divided into three phases: (1) preparatory, (2) implementation, and (3) post-spray operation.

The *preparatory phase* started 12 weeks before the implementation phase and is crucial to starting IRS spray operations on time.

The main activities of this first phase were:

- Pre-spray environmental compliance inspection.

¹ Pr. Martin AKOGBETO, CREC/PMI/PNLP/OMS, in Etude du choix d'un insecticide pour la lutte contre le vecteur du paludisme, Rapport final, January 2008.

- Logistic needs assessment to proceed to materials procurement (e.g., insecticides, personal protective equipment, respiratory masks), car rental and preparation and/or rehabilitation of logistic infrastructures (e.g., warehouse, disposal pit). See the logistics section 3.3 for details.
- Human resource needs assessment followed by recruitment and training of staff involved in IRS activities (e.g., information, education, and communication [IEC], spray operations, supervision, data entry, logistic management, cleaning). Training is an important aspect of IRS. Staff (IEC mobilizers, spray operators, supervisors, Ministry of Health [MOH] medical personnel, cleaners, drivers, logistic assistants, service technicians, data clerks, and security guards) are trained on their specific IRS tasks and on the risks and precautions related to insecticide manipulation or exposure.
- IEC activities such as producing IEC materials (e.g., leaflets, forms, banners, compact discs [CDs]); buying local radio time for IRS spots; and most important, the recruitment and training of IEC mobilizers in the four targeted communes. IEC mobilizers' role is to identify houses to be sprayed in the villages, sensitize the population on the importance of IRS, and inform households on arrangements to be taken before, during, and after spraying operations. A new IEC form, using a pictogram, has been introduced and tested during this IRS round to improve IEC data collection, which remains a challenge. IEC activities continued during the second and third phases.

The *implementation phase* is usually called “IRS operations.” During this phase, the main activities are insecticide spraying of structures by spray operators deployed in the villages; data collection and entry; and supervision of IRS operations. On March 8, 2010, IRS operations were technically launched by Dr. Hubert DEDJAN, director of Regional Directorate of Health (DDS, or Direction Départementale de la Santé), in the four communes. On April 15, 2010, the IRS operations were officially launched by Pr. Issifou Takpara, Minister of Health in Benin, Mr. James KNIGHT, Ambassador of the United States in Benin, and Mr. Francois HOUESSOU, Prefect of Ouémé-Plateau, during a ceremony at Ouanho warehouse. Spray operations lasted 44 days, including the day for technical launch. A total of 265 spray operators, of whom 41 were team leaders and 19 were group leaders, were deployed in the field. Spray operators were supported by the RTI operational manager and logistic team. They were supervised by the staff of the MOH, Ministry of Environment and Natural Protection (MOENP), and Ministry of Agriculture (MOAEP) throughout the operations. Staff included hygiene agents for close supervision. Four data clerks entered daily all IRS data collected by spray operators.

The main activities of the *post-spray operations* phase are

- The cleaning, maintenance, and storage of all logistic materials (including insecticide) in accordance with rules and norms required by IRS.
- Waste disposal by incineration of equipment used or deterioration (e.g., pesticide sachets, gloves, respiratory masks, broken pumps).

- Visiting of households by IEC mobilizers to evaluate arrangements before, during, and after operations.
- Cleaning and treatment of IRS data by the monitoring and evaluation (M&E) team to identify results of the IRS round.
- Evaluation of the efficiency of IRS operations, conducted by CREC, to control the quality and homogeneity of the spraying by the spray operators and to monitor entomological activities for vector sensibility and insecticide durability.

The results of the IRS Round 3 in the four targeted communes are summarized below:

- 205 spray operators sprayed 166,910 of the 168,010 structures found, providing IRS coverage of 99%.
- 636,448 people were protected by IRS, including 88,912 children under five years of age and 47,947 pregnant women.
- 29,227 insecticide sachets were used to spray 166,910 structures, with an average of 5.71 structures sprayed per sachet.
- 176,230 insecticide-treated nets were found and declared used by the population.
- The environmental monitoring conducted at the end of operations reported that of 2,483 sprayed rooms inspected, 2,333 rooms (93.9%) were compliant with post-spray instructions.
- The environmental supervision report indicated that 98.94% of spray operators complied with security and hygiene IRS rules during operations.

The main lessons learned this round are summarized here:

- Pre-spraying coordination between in-country team, RTI suppliers, and home office is needed to track insecticide order for timely arrival in-country.
- Prolonged absence (close to six months) of a chief of party (COP) constitutes a major challenge in the above-noted coordination that is required for pre-spraying activities.
- The new IEC data collection form with pictures, created this round, was tested by some IEC mobilizers in the field. This data form was more easily used by IEC mobilizers and has provided some quantitative IEC data.
- The flexibility in scheduling spray operators' activities by considering local activities and events (e.g., working hours in fluvial regions, market day, village's celebrations) provided excellent results in avoiding household absenteeism during spray operations.
- Hiring megaphone users on motorbike and traditional gongonneurs improved IEC activities and facilitated community mobilization, especially in remote areas.
- M&E tools, such as Country and Commune Master Tracker and the introduction of an M&E chapter in the IRS training guide, improved IRS data monitoring and quality assessment.

There were no reports of adverse effects due to insecticide contamination throughout the entire 3rd round of spray operations.

1. Country Background

1.1 President's Malaria Initiative in Benin

Malaria is one of the leading causes of morbidity and mortality in Benin with a direct negative impact on social and economic development. The Government of Benin (GOB) and all its key partners in development view malaria control as a top priority. In December 2006, Benin was identified by the United States Agency for International Development (USAID) as one of eight countries to receive funding during the third year of the United States President's Malaria Initiative (PMI). PMI seeks to scale up malaria prevention and treatment interventions in high-burden countries in sub-Saharan Africa. The goal of this initiative is to reduce malaria-related mortality by 50% in PMI countries, targeting the most vulnerable groups (children under five years of age and pregnant women) with preventive and therapeutic interventions. The PMI Malaria Operational Plan is developed with the participation of the Benin National Malaria Control Program (NMCP or Programme National de Lutte contre le Paludisme) and nearly all national and international partners involved with malaria prevention and control in the country. PMI major interventions in Benin include artemisinin-based combination therapy (ACT), insecticide-treated nets (ITNs or long-lasting insecticide-treated nets [LLINs]), intermittent preventive treatment for malaria in pregnancy (IPTp), and indoor residual spraying (IRS) with insecticides.

In 2007, USAID/PMI and the NMCP, in collaboration with the Entomologic Research Center of Cotonou (CREC or Centre de Recherche Entomologique de Cotonou) identified different regions in Benin for IRS interventions. In 2008, the in-country PMI team and the NMCP agreed to focus IRS activities in four communes of the Ouémé Region in the South of Benin: Adjohoun, Akpro-Misséréte, Dangbo, and Sèmè-Kpodji. In 2009, a long-term IRS strategy was elaborated to expand coverage to others regions with support from other donors.

By the end of 2010, PMI will assist the GOB to achieve the following target in IRS: 85% of houses in geographic areas targeted for IRS will have been sprayed. The expected result for IRS is: at least 85% of houses for three rounds of IRS (approximately 210,000 households with a population of 750,000 people) in geographic areas targeted for spraying will have been sprayed.

RTI International was contracted by USAID to implement IRS activities and was tasked to perform the following activities in Benin:

- Provide strategic, technical, management, and operational support for IRS activities in the four targeted communes.
- Build capacity in Benin to enable national partners to conduct IRS without the need for external assistance in the future.

Two IRS rounds have already been conducted in the four targeted communes. Round 1 in July–August 2008 sprayed 142,814 structures, with a coverage rate of 94.1%, and protected 521,738 people. Round 2 in March–April 2009 sprayed 156,233 structures, with a coverage rate of 99.4%, and protected 512,491 people.

Figures 1 and 2 provide some details on these two rounds.

Figure 1. IRS Coverage in 2008 and 2009

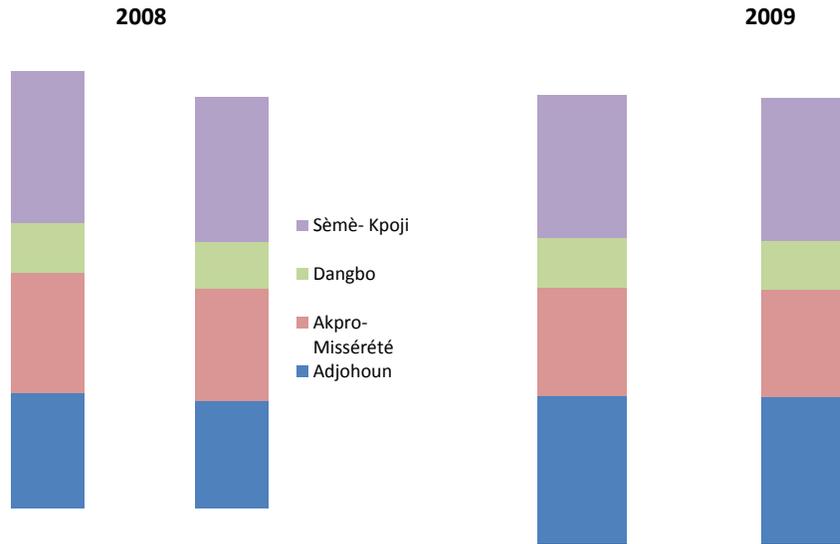
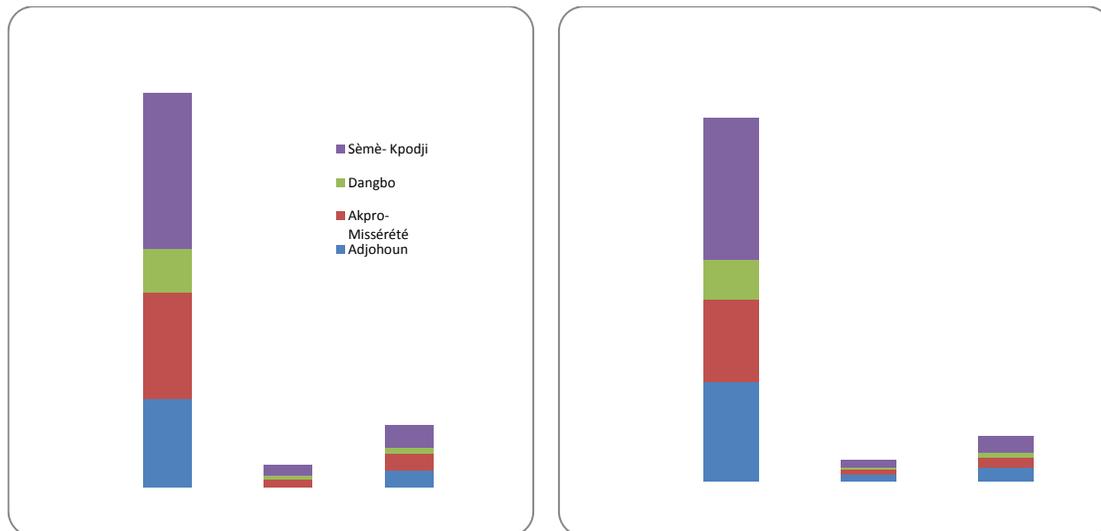


Figure 2. IRS Protection in 2008 and 2009



In 2010, two IRS rounds (Round 3 and Round 4) were planned in the four targeted communes, respectively, for the periods of March–April and August–September. In 2011, IRS activities are expected to move into northern Benin where malaria

transmission is more seasonal, and malaria-related morbidity/mortality in priority groups is higher.

Round 3 of IRS began on March 8 and ended on April 28, 2010.

This Spraying Performance Report summarizes IRS activities, achievements, lessons learned, and recommendations for future IRS in Benin.

1.2 Malaria Situation

In 2009, Benin's population was estimated to be 9 million, of which approximately 18% are children under five years of age and 6% are pregnant women. In 2006, 33% of the population was estimated living under the poverty line, with less than \$2 US per day. In 2008, Benin ranked 161 out of 179 countries on the Human Development Index and had a gross national income per capita (PPP international \$) of only \$1,250 US². Life expectancy is 54 years for men and 55 years for women (2008 World Health Statistics). For the period from 2001–2006, the infant mortality rate was 67 per 1,000 live births; the under-five mortality rate was 125 per 1,000 live births; and the maternal mortality ratio was 397 per 100,000 live births (DHS, 2006³).

As in many sub-Saharan African countries, malaria is a leading cause of morbidity of the general population and of mortality among children under five in Benin. Roll Back Malaria (RBM) estimated that in 2004 there were about 3 million cases of malaria illness (all ages). In 2008, malaria accounted for 39.6% of recorded outpatients consultations (43.5% for children under five years of age), 25% of all hospital admissions (34.6% for children <5), and about 32% of deaths of children under five. In 2008, malaria average mortality ratio was 5 per 1,000 cases (14 per 1,000 cases in 2005)⁴.

The primary malaria vector in Benin is *Anopheles gambiae* s.s. The malaria situation in Benin reflects the presence of vector breeding sites throughout the country, as well as a seasonal rainfall pattern that increases the number of such sites during the rainy seasons. Benin experiences long rainfalls across the country (April–July) and secondary short rainfalls in the South (October–November). Ubiquitous vector production in the presence of a large number of humans with circulating malaria parasites explains why Benin is holo-endemic for malaria and transmission is consistent across the country. The peaks of malaria transmission happen during and after the rainy seasons (main seasonal peak in May). The 1999 Mapping Malaria Risk in Africa project estimated that 100% of the population lives in areas with high-intensity transmission. Entomological inoculation rates for *A. gambiae* range from 11 to 58 infective bites per person per year, 75% of which occur during the long rainy season.

As malaria is endemic nationwide and is a major cause of morbidity and mortality, it presents an enormous economic strain on Benin's development. Households in Benin

² WHO Benin Web site: <http://www.who.int/countries/ben/en/>

³ Institut National de la Statistique & Macro International Inc., DHS Benin 3, 2006, November 2007.

⁴ WHO, Rapport 2009, NPO ISTMAL/OMS Benin.

are estimated to spend 34% of their annual income on the treatment and prevention of malaria.

1.3 National Malaria Strategy

The GOB views malaria control as a top priority for the development of the country. The GOB is a signatory to RBM and the Abuja targets⁵. In 2007, Benin's government expenditure on health represented 10.7% of total government expenditure⁶, with about 1% of the health budget allocated for malaria. Today, Benin continues to receive significant support from national and international partners in health⁷. It is one of the best-funded countries of Western Africa for malaria control spending \$2.8 US per capita for the period 2005–2010⁸. Key international partners are the World Bank (WB), the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), and the PMI. Because of their combined efforts, real progress in malaria treatment and prevention has been achieved.

The GOB has provided authority to NMCP to take the lead in malaria control in Benin. In 2005, a new national policy was issued together with a four-year strategic plan for 2006–2010. The new national policy includes LLIN, rapid diagnostic tests, ACT, and sulfadoxine-pyrimethamine for IPTp. The overall goal of GOB is to reduce malaria-related morbidity and mortality by 50% by 2010. In 2009, the NMCP developed its first national work plan to integrate all partners' and actors' activities in malaria control in order to avoid duplication and resources misuses. This initiative is considered a best practice in Africa.

In 2007, Benin was selected as one of the eight countries to receive funding in the third year of PMI. To support the GOB in its malaria control strategy, PMI developed an IRS strategy in collaboration with NMCP. Since vector control is a highly effective means of malaria prevention, IRS is included in the third axis of the Malaria Strategic Plan 2006–2010.

1.4 Commune Selection

In 2007, the following criteria were used by the NMCP and the Entomologic Research Center of Cotonou (CREC or Centre de Recherche Entomologique de Cotonou) to select the project areas:

- High malaria prevalence in targeted groups
- High entomological inoculation rates
- High vector densities
- High infant mortality rate

⁵ The Abuja Declaration at: www.rollbackmalaria.org/docs/abuja_declaration.pdf

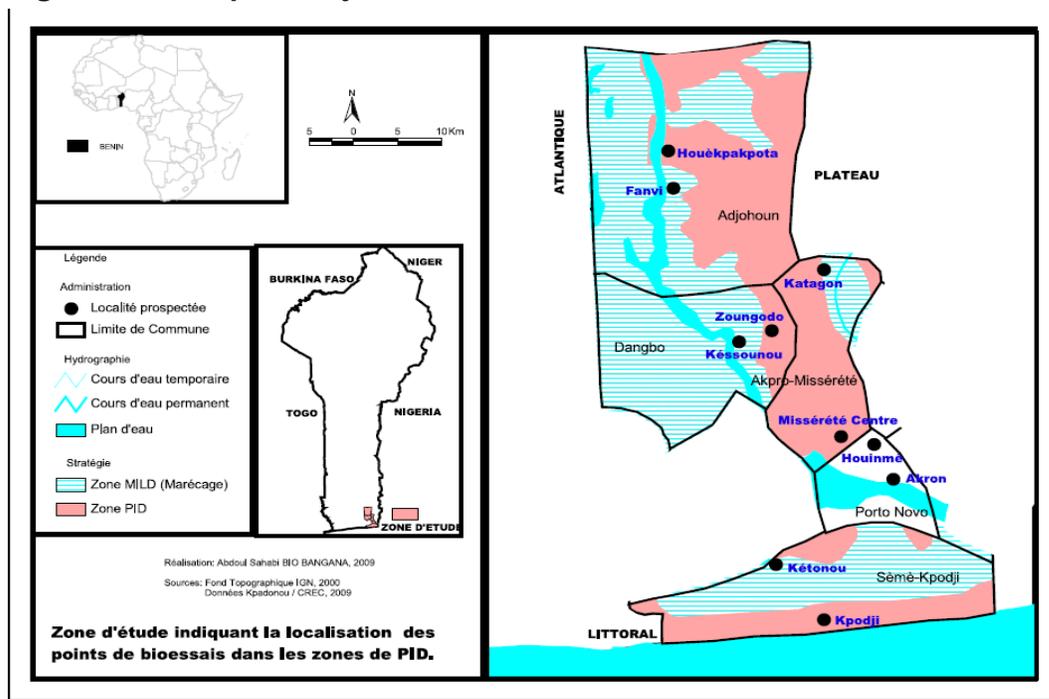
⁶ WHO (2010), World Health Statistics: http://www.who.int/whosis/whostat/EN_WHS10_Full.pdf

⁷ In 2007, the private expenditure on health as a percentage of total expenditure on health ratio was 48.2% and the external resources for health as percentage of total expenditure for health ratio was 21.3%. Source: WHO (2010), World Health Statistics: http://www.who.int/whosis/whostat/EN_WHS10_Full.pdf

⁸ WHO, Rapport 2009, NPO ISTMAL/OMS Benin, p. 3.

Using these criteria, the NMCP identified these potential target areas for IRS in the southern region of Benin: Ouémé/Plateau Regions, Mono/Couffo Regions, and Zou/Collines Regions, as well as the city of Natitingou in the northwestern region of Atacora (see Figure 3).

Figure 3. Map of Project Areas



Four communes within the Region of Ouémé Plateau were selected by NMCP and PMI to conduct the IRS pilot program: Adjohoun, Akpro-Misséréte, Dangbo, and Sèmè-Kpodji. Ouémé is located within the humid zones of southeast Benin and was chosen for spraying most notably because it has one of the highest incidences of malaria in the country⁹. Out of a population size of 1.3 million in Ouémé in 2006 (Annual Statistics, 2006¹⁰), there has been a total of 186,000 cases of malaria, accounting for 37% of all health-related diseases. In 2006, 384 deaths were recorded due to malaria.

In September 2009, a long-term strategy for IRS was elaborated with the objective to expand IRS activities to other communes in Benin with the support of other donors.

⁹ Pr. Martin AKOGBETO, CREC/PMI/PNLP/OMS, in Etude du choix d'un insecticide pour la lutte contre le vecteur du paludisme, Rapport final, January 2008.

¹⁰ Institut National de la Statistique & Macro International Inc., DHS Benin 3, 2006, November 2007.

2. IRS Preparatory Phase

2.1 Environmental Assessment

RTI was tasked to provide technical assistance to both the NMCP (at national and regional levels) and the DDS for the coordination and implementation of project activities.

In accordance with USAID 22 Code of Federal Regulations (CFR) 216.3(b), RTI conducted a Supplemental Environmental Assessment (SEA) in March 2008. The objectives of this assessment were to

- Identify environmental and socioeconomic resources that could potentially be affected by the project.
- Predict positive and negative effects and the extent to which positive effects could be enhanced and negative effects mitigated.
- Quantify and assess the significance of effects where possible.
- Consider the need to compensate for any significant residual negative effects.
- Identify methods to mitigate and monitor resources that might be affected by the project.

The Environmental Impact Assessment (EIA) was approved by USAID and validated by the Benin Environmental Agency (ABE, or Agence Beninoise pour l'Environnement) and the Ministry of Environment and Nature Protection (MOENP) in 2008. As a result, the IRS project received a certificate of environmental compliance. The SEA and EIA were prepared by the IRS team with collaboration from CREC. In June 2008, the MOENP issued an environmental conformity certificate with an Environmental Management Plan (EMP) to be implemented during IRS operations.

Carbamates were chosen as the preferred class of insecticide, following scientific evidence collected by CREC resulting from a study of five other insecticides in accordance with World Health Organization (WHO) procedures. Bendiocarb is recommended for IRS use by WHO and is registered in Benin by the National Accreditation and Control Committee for the Registration of Pharmaceutical Products (Comite National d'Agreements et de Controle des Produits Phytopharmaceutiques). After each round, in 2008 and 2009, the CREC monitored entomological activities for vector sensibility and insecticide durability. Their reports advised to continue using carbamates as the preferred class of insecticide for IRS operations, and to conduct two rounds of spraying per year for covering the two peaks of transmission in the four targeted communes.

In 2010, the pre-spray environmental compliance inspection was conducted from February 28 to March 13 by Mr. Autman Tembo, Environmental Specialist based at the RTI Regional Office in Nairobi, Kenya. Mr. Tembo visited the four targeted communes, accompanied with the RTI acting COP, met all key partners and stakeholders involved in IRS activities, and worked with the representative of the Regional Directorate of Environment and Nature Protection (DDEPN/MOEPN) to

ensure that all environmental safeguard processes were being followed and that the program complied with recommendations made before spraying.

Mr. Tembo also inspected the main and central warehouses in Ouanho and the second one in Adjohoun (set up to facilitate IRS spray operations in this commune). His report indicated some recommendations on logistic management tools and daily monitoring of insecticide and commodities uses.

Concerning waste disposal, the incinerator identified in IRS Round 2 (in Porto Novo hospital) remains operational for Round 3.

2.2 Needs Assessment

2.2.1 Logistic Needs and Procurement

Logistic needs are estimated on the total population to be protected (approximately 500,000 people per round in Benin) and number of structures to be sprayed (approximately 150,000 per round), and based on previous IRS rounds experience of consumption in insecticide and materials. For FY 2010, two rounds of IRS are planned: Round 3 in March–April and Round 4 in August–September. A single international procurement was made for these two rounds based on quantities of equipment and insecticide required, remaining stock still usable from FY 2009, and replacement of damaged equipment.

International procurement encountered significant problems this round, and the materials were delivered in March 2010, almost at the beginning of the Round 3 spray operations. This situation created major stresses in our operations and endangered the quality and the launch of IRS. This problem was found to be due to several factors, indicated below.

The logistics needs estimates were prepared and sent to RTI in Washington by the Benin mission at the end of November 2009. At the same time, the RTI COP left the mission on November 30 and was not replaced until the middle of April 2010. No proper handover was made to the RTI Benin team, and the RTI operations coordinator was designated as acting COP without sufficient clarification and understanding of his role, level of responsibility, and level of involvement in the decision making process. Furthermore, the FY 2010 IRS work plan was submitted to PMI on December 1, 2009, and was not approved until March 16, 2010. Specifically, there was a lack of clarity as to whether or not to plan procurement and/or program activities for 12 or 18 months. This discussion between USAID/PMI and RTI continued for several weeks. In the meantime, the draft work plan was not in a state close enough to approval that would allow RTI to send a Request for a Task Order Proposal (RFTOP) to CA-USA before the end of January. Moreover, at the end of February, CA-USA informed RTI that its supplier in South Africa encountered problems in packaging the insecticide (due to a problem in the supply of sachets), which caused additional delays in the insecticide supply. Insecticides were shipped eventually by air and arrived in Benin a few days after the beginning of spray operations. Fortunately, the remaining stock of insecticide from the previous round was sufficient to allow IRS operations to begin on time.

Analysis of key problems:

- Absence of a COP, lack of clear handover to the RTI national staff, and lack of clarity about and understanding of their roles and responsibilities in this transitional state.
- Extended process of decision making and approval as to whether procurement and/or program activities should be planned for 12 or 18 months.
- Many RTI internal players and numerous steps in the procurement process, difficulties to respect the 90-day procurement, which sometimes start late.
- RTI does not have direct management control over commodity or equipment suppliers as we contract sourcing, shipping, and customs clearance to CA-USA.
- Insecticide suppliers do not maintain stocks of commodities and have to produce and pack insecticide for each order.
- Everything procured is air-freighted which adds to expenses.

RTI is aware of these problems, and an internal process to improve IRS procurement has already started at headquarters and regional levels. In May 2010, a series of important meetings were held at RTI, and recommendations for improving procurement were made and transmitted to all IRS missions in the field.

Table 1 shows the international procurement for Round 3 and Round 4 of IRS.

Table 1. International Purchase for Round 3 and 4 - 2010

Description	Shipment	Quantity (Received)
Debit Flow Regulator Ref/no. 64 catalog no. 148.000X	Air	200
Gloves	Air	5,040 pairs
Respirators/masks	Air	23,040 units
Pregnant test kits	Air	500 units
Pumps	Air	200 units
Coveralls	Air	600 units
Pesticide/bendiocarb	Air	56,000 sachets

RTI conducted the local procurement of barrels, towels, soap, trash bags, plastic sheets (to cover household furniture that was unable to be moved) and other supplies.

As in 2009, the IRS coordination and logistic teams also conducted field visits to selected villages of targeted communes to meet all stakeholders, update transportation routes and road access, and re-estimate the average number of structures to be sprayed, in close collaboration with the communes' coordinators.

Before IRS activities started in the field, the central warehouse at Ouanho and the secondary warehouse at Adjohoun were inspected and renovated to meet environmental standards when necessary. As water supply in the warehouses is a vital safety aspect for IRS operations, the water supply system was closely checked in both warehouses. Water tanks were installed to compensate for possible water shortage (Figure 4). In addition, the following activities were conducted:

At the main warehouse at Ouanho:

- Sealing cracks in the progressive rinsing area
- Gravel sifting from soak pits to clean sand
- Replacement of used ropes in the drying area
- Cleaning of the soak pits
- Revision of the electrical system

At the secondary warehouse at Adjohoun:

- Revision of the electrical system

Figure 4. Washing Bays and Soak Pits



The washing bays and soak pits in Ouanho and Adjohoun

- Personal protective equipment (PPE)—coverall, boots, helmet, pair of gloves, and respiratory mask—were distributed per commune at the beginning of spray operations. When necessary, damaged equipment was replaced to ensure correct protection along the spray operations. Gloves were replaced every 10 days and respiratory masks every two days. Table 2 shows the initial distribution of PPE per commune.

Table 2. PPE Initial Distribution

Communes	Coveralls	Boots	Helmets	Pumps	Gloves	Respiratory Masks
Adjohoun	147	79	76	58	74	320
Akpro-Misséréti	162	85	76	65	84	320
Dangbo	122	64	58	45	66	320
Sèmè-Kpoji	234	122	112	97	123	320
TOTAL	665	350	322	265	347	1,280

A competitive bidding process, published in newspapers, was conducted to purchase vehicles for use during the spray operations to transport spray operators, and coordinate and supervise activities. Two car rental companies were selected. To ensure the quality of these vehicles, technical inspections were conducted by the RTI mechanic-driver before contracts were signed. Thirty-nine vehicles, out of 57 inspected, were finally selected and rented: 33 buses with a capacity of 18 people each were divided in the communes (11 to Sèmè-Kpodji, 8 to Akpro-Misséréti, 8 to Adjohoun, and 6 to Dangbo); and six 4x4 trucks were used for coordination and supervision activities (four vehicles were assigned to each commune coordinator).

2.2.2 Human Resources Requirements

IRS activities required a large staff for spray operations, IEC mobilization, logistic management, cleaning and maintenance, transport and supervision. In total, more than 500 seasonal people coming from the targeted communes are involved in IRS operations in the field. Following one of the IRS Task Force¹¹ recommendations made in 2009, priority was given to seasonal staff who performed during previous IRS rounds in order to strengthen local capacity, ensure better quality in IRS operations, and facilitate IRS acceptability rate in the population. Dr. Jean-Luc Taton was hired as the new RTI COP and joined the team in mid-April 2010.

IRS Operations

Forming the core of the IRS spray operations were 205 spray operators who were deployed for 44 days in the four communes. These operators were recruited at the commune level with assistance from chief doctors and local authorities, including the mayor and community leaders. Both males and females were eligible. The selection was based on the following criteria: native of the commune, reading and writing capability, physical ability to carry pulverizing material (10 kg), medically fit/acceptable after a medical examination to handle pesticides, women who are not pregnant, respected in the community, do volunteer work.

¹¹ NMCP, USAID, MOH, MEPN, MOEAP, Ministry of Interior, Ministry of Foreign Affairs, Ministry of Decentralization and Local Government, DDS-O/P, UNICEF, CREC, University of Abomey-Calavi, Development and Research Institute, mayors of the four targeted communes.

The spray operators were supported, coordinated, and directly supervised by an operation team of 41 spray team leaders and 19 spray group leaders (playing also the role of direct supervisors). In addition, 4 commune coordinators, 4 data clerks, 4 logistic assistants, 4 financial assistants, 26 cleaners, and 16 service technicians completed the operation team. Table 3 enumerates the operational agents by commune.

Table 3. Operational Agents per Commune

Communes	Spray Operators	Teams Leaders	Group Leaders	Commune Coordinators	Data Clerks	Finance Assistants	Cleaners	Logistic Assistants	Service Technicians
Adjohoun	45	9	4	1	1	1	6	1	4
Akpro-Misséréte	50	10	5	1	1	1	7	1	4
Dangbo	35	7	3	1	1	1	4	1	4
Sèmè-Kpodji	75	15	7	1	1	1	9	1	4
Total	205	41	19	4	4	4	26	4	16

Medical Test of Spray Operators

To assess if the spray operators were physically fit and able to conduct IRS activities, the chief doctors of each commune performed physical examinations. Only those spray operators who received a medical certificate attesting to their health and who had a proven ability to perform IRS operations were accepted as spray operators. All female spray operators and cleaners were also tested for human chorionic gonadotropin levels to determine if they were or were not pregnant.

IEC Activities

In total, 253 IEC mobilizers were recruited to conduct IEC activities. Both males and females were eligible. Table 4 shows IEC mobilizers disaggregation by gender and commune. The selection was based on the following criteria: native and resident in the commune, proven track record in social mobilization, involved in commune health centers activities, and participated in at least one previous IRS round.

Table 4. IEC Mobilizers per Commune

Communes	IEC Mobilizers	Women	Men
Adjohoun	72	34	38
Dangbo	38	16	22
Akpro Missérété	68	44	24
Sèmè-Kpodji	75	29	46
Total	253	123	130

Figure 5. IEC Mobilizers



IEC mobilizers and their supervisor.

Supervision

IRS supervision was provided by a team from the MOH, MOENP, and Ministry of Agriculture and Fishery (MOAEP or Ministère de l' Agriculture, de l'Élevage et de la Pêche). For Round 3, the number of supervisors was increased to ensure adequately the process of IRS country ownership, as indicated in the IRS sustainability plan (Figure 5).

National, regional, and local institutions were involved in supervision activities and provided representatives. Institutions were as follows (Table 5):

- National level: NMCP, the Directorate of Hygiene and Sanitation (DHAB or Direction de l'Hygiène et de l'Assainissement de Base), and the Directorate of Agriculture (DAGRI)
- Regional level: NMCP, the Regional Directorate for Health (DDS or Direction Departementale de la Santé), the Health Promotion and Disease Service (SPPS or Service de Promotion et de Prévention de la Santé), the Monitoring Evaluation and Planning Service (SESP or Service Evaluation Suivi et Planification), and the Hygiene and Sanitation Service (SHAB or Service de l'Hygiène et de l'Assainissement de Base)

- Commune level: DDS, SHAB (for close supervision in the communes), and the Regional Directorate for Environment/MOENP (DDEPN or Direction Departementale de l'Environnement et de la Protection de la Nature)

Table 5. Supervisors per Institution

Institution	Number of Agents by Level		
	National	Regional	Commune
NMCP	10	3	
DHAB	3		
DDS		1	3 health zone coordinators and 4 commune chief doctors
SPPS		1	
SESP		1	
SHAB		1	29
DAGRI/MAEP	1		
DDEPN/MEPN			1
TOTAL	14	7	37

RTI staff

The IRS management structure at the national level comprises the COP, operations manager, logistic officer, financial manager, program assistant, and driver. In addition, temporary staff were hired to provide additional support during the spray operations: 1 M&E senior consultant, 1 IEC junior consultant, 1 storekeeper, and 6 security guards (for the warehouses).

2.3 Trainings

Training is an important aspect of IRS activities. The objectives of IRS trainings were to

- Build/strengthen the capacity of the host government at the national, regional, and local levels to implement and supervise the IRS program.
- Train all people involved in IRS activities to perform their tasks.
- Inform of the risks and precautions related to insecticide manipulation or exposure.

In respect of the IRS sustainability plan, high-level officers of the MOH (NMCP, DHAB, and DDS) were fully involved and took more responsibility in conducting training of trainers (TOT), IEC mobilizers, and spray operators.

In total, 793 people were trained on different IRS topics; some of them received more than one training.

2.3.1 Training of Trainers

The 2010 IRS TOT was conducted from February 22–26, 2010, in the DDS conference room in Porto-Novo. Dr. Vincent Sodjinou, Chief of SPPS in the DDS, Dr. Victor Nounagnon, Chief of SESP in the DDS, Mr. Sourou Adjinda, Chief of SHAB in the DDS, Dr. Issac Dovoedo from DDEPN, M Desire Ligan from DAGRI, and an NMCP team headed by Dr. Simon Atayi, conducted the TOT. This important leading team was technically supported by two RTI members, Dr. Sy Ngayo, Senior Consultant, and Eugene Kiti, IRS Operations Manager.

In total, 33 hygiene agents (15 females and 18 males) were trained to train spray operators and to supervise IRS operations in each commune.

Nine other people involved in IRS activities (5 logistic assistants, 3 service technicians, and 1 warehouse manager), the four Chief of Commune Health Post Doctors, and five NMCP and DDS officers also participated in the TOT.

The *IRS Training Guide for Spray Operations*, used in TOT, was supplemented with a specific chapter in Monitoring and Evaluation Quality Insurance. This was a result of recommendations from the PMI Data Quality Assessment in December 2009. The majority of people trained were the same as in the previous round.

Figure 6. TOT Session



Dr. Hubert Dedjan (DDS) encouraging TOT trainees.

The TOT open and closing ceremonies (Figure 6) were chaired by Dr. Hubert Dedjan, Director of DDS of the Ouémé-Plateau.

2.3.2 Spray Operators Training

The training of spray operators was conducted from March 2–5, 2010. In total, 330 potential agents (operators, team and group leaders) for IRS were trained (316 males and 14 females) (Table 6). Only those who passed the written and practical tests at the end of the training were sent to undergo a physical examination before they could begin the other trainings. A total of 265 people were finally selected to continue the

training (205 spray operators, 41 team leaders, and 19 group leaders). Nine training sessions were organized at commune level: three sessions were held at Sèmè-Kpodji, and two each at Dangbo, Akpro-Missérété and Adjohoun. The spray operator training sessions lasted four days and were conducted by 21 hygiene agents, the ones trained in TOT previously, from the Ouémé Region. Representatives from NMCP, Service of Hygiene, DHAB, MOENP, MAEP, and DDS supervised all the training sessions.

Table 6. Spray Operators Trained per Commune

Communes	Number		Total
	Men	Women	
Adjohoun	72		72
Akpro-Missérété	73	2	75
Dangbo	63	2	65
Sèmè-Kpodji	108	10	118
Total	316	14	330

2.3.3 IEC Trainings

IEC training was organized in two parts: (1) training of IEC trainers, and the (2) training of IEC mobilizers.

IEC Training of Trainers

The IEC TOT was conducted on February 12, 2010. The training was held by the IEC teams of NMCP at national and regional levels and the IEC team of DDS, supported by the RTI Benin IRS team. Participants were the 36 chiefs of health post and the four commune coordinators of the targeted communes. The main objective of this training was to provide the participants with adequate IEC and social mobilization strategy knowledge related to IRS to serve as relay for IEC mobilizers. They, in turn, trained the IEC mobilizers.

IEC Mobilizers Training

The IEC mobilizer trainings were conducted February 16–19, 2010 in the four communes (one day of training per commune). Chiefs of health post, with the support of NMCP, DDS, and RTI staff, served as trainers. For all communes, 253 IEC mobilizers (130 males and 123 females) were trained on social mobilization, door-to-door sensitization, and the IRS program's role in malaria control (Table 7).

One week after the training, IEC mobilizers' activities started officially with a ceremony organized in each commune with the active participation of residents, faith leaders, opinions leaders, and local authorities. During the ceremonies, each IEC mobilizer received IEC material, such as bags, T-shirts, leaflets, posters, and other IRS IEC documents.

Table 7. IEC Mobilizers Trainings per Commune

Communes	IEC Mobilizers	Women	Men
Adjohoun	72	34	38
Dangbo	38	16	22
Akpro Misséréte	68	44	24
Sèmè-Kpodji	75	29	46
TOTAL	253	123	130

Training Session on New IEC Data Form

In 2008, an IEC collection data form was created for IRS operations but was never used due to low literacy level of the majority of the IEC mobilizers, who were not able to fill out the form correctly. To improve the level of IEC data collection, the NMCP proposed and created a new IEC data form, using pictures. This form is similar to the one used for nation vaccination days (Jours national de vaccination or JNV). On March 4, 2010, a training session on the new IEC data form was conducted by the IEC teams of NMCP and DDS and RTI staff at the DDS conference room. The form was finalized and adopted during this training session. Chief health posts were trained on its use, and in turn trained the IEC mobilizers that they supervised.

2.3.4 Other Trainings

Medical Treatment of Intoxication Cases

Medical staff members in the four communes (28 health post chief, 4 commune coordinators, and 4 chief medical doctors) were trained on medical treatment and care in case of intoxication with bendiocarb. This training was conducted on April 6, 2010, by Dr. Paul A. Ayello, lecturer in toxicology, at the University of Abomey-Calavi at Cotonou.

In addition, all IRS staff members received training on the risks related to insecticide manipulation and the precautions to reduce any harm caused by physical contact with bendiocarb. They were advised to immediately inform commune coordinators and to transfer contaminated persons to health centers where first aid kits were available.

Fire Security Training

Ten IRS staff working at the two warehouses (Ouanho and Adjohoun) were trained for half a day by two firefighters on fire security and management and the correct use of fire extinguishers.

Data Capture Training

Four data clerks (3 females and 1 male), who were computer-literate in MicroSoft Word and Excel, were recruited and trained on IRS data entry on March 9, 2010. Each data clerk was in charge of data management of one commune. They were trained and supervised daily by the senior M&E consultant.

Coveralls Washing Training

On March 6, 2010, 26 cleaners from the four communes were trained by the DDEPN and RTI staff on secure and adequate washing of coveralls to avoid insecticide contamination hazards.

Technical Maintenance Training

From March 2–4, 2010, 16 people (12 males and 4 females) from the four communes were trained by the RTI mechanic-driver on technical maintenance repair of IRS pump equipment. Technicians were divided into the four communes.

Transport Security Training

On March 6, 2010, 39 drivers were trained by DDEPN and RTI team on safe driving, insecticide transport, use of PPE, vehicle cleaning, and utilization of fire extinguishers.

Table 8 summarizes all information on people trained on IRS topics.

Table 8. Summary List of IRS Trainings

Categories of Persons Trained	Training									
	Training of Trainers	Spraying Operation	IEC Trainers	IEC Mobilizers	Medical Treatment of Intoxication Cases	Fire Security	Data Capture	Coveralls Washing	Technical Maintenance	Transport Security
Hygiene Agents	33	21								
Spray operators		330 (265 selected on final test)								
Logistic Assistants	5					5				
Service Technician	3								16	
Cleaners								26		
Drivers										39
Guards						3				
Warehouse manager	1					1				
IEC mobilizers				253						
Data clerks							4			
Communes coordinators	4	4	4	4	4					

Categories of Persons Trained	Training									
	Training of Trainers	Spraying Operation	IEC Trainers	IEC Mobilizers	Medical Treatment of Intoxication Cases	Fire Security	Data Capture	Coveralls Washing	Technical Maintenance	Transport Security
Commune Chief doctors				4	4					
Chief health post			36	36	28					
DDS	4		2							
NMCP National			3							
NMCP Regional	3		3		3					
DDEPN	1							1		
DAGRI	1									
RTI	6		4		4	1		1		
Total	61	355	52	297	43	10	4	28	19	39

2.4 IEC Activities and Community Mobilization

2.4.1 IEC Activities

This IRS Round 3 IEC strategy focused on key stakeholders' and beneficiaries' involvement in order to achieve IRS's expected results and to create long-term sustainability through a better understanding of malaria control and prevention dispatched through different levels of audiences.

The objectives of the IRS IEC addressing these two categories were to:

- Inform key stakeholders about safety issues related to the environmental and health effects of using insecticides, and to strengthen their knowledge on malaria control and prevention methods and the benefits of IRS in particular.
- Inform beneficiaries about the positive benefits of IRS in controlling and preventing malaria and malaria-related deaths, and the beneficiaries' role before, during, and after spray operations.

Lessons learned and recommendations from the previous rounds of IRS were predominant to achieve these objectives.

In terms of capacity building, the MOH (through the NMCP and DDS) was fully involved in IRS activities from the beginning to the end of the operations. Ministry of Communication, Ministry of Interior, and MOENP were also mobilized.

The following new initiatives were established during this round:

- New IEC data form using pictograms was created by the IEC specialists of NMCP and tested in the field by some IEC mobilizers.
- IEC mobilizers using megaphones were deployed in addition to traditional *gongonneurs* (bell ringers who act as village announcers).
- Frequent working sessions between radios and IEC teams of DDS and RTI.
- Joint supervision of IEC mobilizers by the DDS and RTI.
- High mobilization of opinion leaders in each targeted village.

The IEC activities conducted during the IRS Round 3 included the following:

- Updating and producing IEC materials, including banners, leaflets, stickers, CDs of IRS songs, IRS booklets, T-shirts, and IRS bags.
- Contracting with four local radio stations with the largest audiences (Radio Weke, Radio Alleluia, Radio Gerddes, and Radio la Voix de la Valee) to reach all households (even those in far remote areas) and to broadcast in local languages the IEC messages, skits and radio spots explaining the benefits of IRS and the precautions to take during IRS.
- Mobilization awareness and advocacy sessions, before and during the spray operations, regrouping more than 535 local leaders (mayors, chiefs of village, opinion and faith leaders, village elders, heads of townships, representatives of nongovernmental organizations [NGOs], etc.), in collaboration with IEC of NMCP and DDS.
- Numerous trainings in IEC (see training section).
- Deploying 253 IEC mobilizers in each targeted area to travel door-to-door to inform households about IRS activities.
- Collecting data using the new IEC form with pictures.
- Deploying megaphone users (Figure 7) on motorbike and traditional *gongonneurs* to inform villagers about the spray operators' schedule and to remind them of arrangements to be made before the spray operators' arrival.

Figure 7. Megaphone Announcements



Megaphone user informing population of IRS activities.

IEC activities began 20 days before the start of IRS operations. Some of them continued during and after the spray operations. Details on certain IEC activities are presented below.

2.4.2 Reproduction of IEC Materials

IEC materials from previous IRS rounds were used and updated, if necessary. Table 9 provides details of the IEC materials produced and available in total for IRS Round 3.

Table 9. IEC Materials Produced and Available in Total for IRS Round 3

Description	Materials Produced in 2010	Total Materials Available for Round 3
Banners	4	12
Leaflets	0	170,000
Stickers	122,000	140,000
Posters	0	200
T-shirts	1,500	1,500
IRS info Bulletin	500	500
Bags	675	675
CD of IRS song	60	60
Data collect forms	2,500	2,500

2.4.3 Community Mobilization

In close collaboration with the NMCP, DDS team, and the chief doctors, RTI organized important advocacy meetings with community leaders, religious and traditional leaders, village chiefs, and local authorities to inform them about IRS strategy and goals and to reaffirm their support (Figure 8). Collaboration with these gatekeepers is absolutely crucial to obtain the complete mobilization and participation of the targeted population with IRS operations.

One week before the beginning of spray operations, IEC mobilizers were deployed in the villages and went door-to-door to visit each household. Using direct communication and IEC materials (i.e., leaflets), they aimed to sensitize the population about IRS benefits; inform them on arrangements and precautions to be taken before, during, and after spraying; and finally to obtain their approval. During these sensitization sessions, IEC mobilizers completed the IEC data form and posted stickers on the doors of each household visited. Unfortunately, the majority of these stickers did not last and fell off before the passage of spray operators because of the weather conditions and nature of some building surfaces. This problem will be addressed during the next spray round.

Figure 8. Collaboration for Mobilization



RTI staff in close discussion with local leaders for community mobilization.

IEC mobilization in the communes was reinforced by radio broadcasts and mass mobilization. The four radio stations contracted broadcasted IRS information seven times per day in French and local languages. They also organized round table debates and radio games during the peak listening times. During the official launching ceremonies of IEC activities in the villages, IEC mobilizers conducted dramatizations and games, creating and using IRS songs, distributing prizes such as T-shirts and CDs, with great participation of the population. Table 10 specifies radio station activities.

To improve mass mobilization, megaphones users were combined with traditional gongonneurs. Megaphone users used electrical audio materials attached to their

motorcycles. They could easily and rapidly travel in the villages, creating animations and covering a large population, particularly in remote areas.

Table 10. IEC Activities Conducted by Radio Stations

Activities	No. of Broadcasts
Spots (French and national languages)	1,904
Release (French and national languages)	1,904
Debates and conference	8
Media coverage	64
News	160
Radio game shows	32
Interviews and testimonials after structures had sprayed	180
Interviews with opinion leaders	300
Public interviews	48
Field operation calendar broadcasting (French and national languages)	816

3. Implementation of IRS Activities

The IRS Round 3 was launched two times: technically and officially.

On March 9, 2010, at Ouanho warehouse, Dr. Hubert Dedjan, Director of DDS at Ouémé-Plateau, launched the technical IRS operations in the four targeted communes. The ceremony was attended by representatives from health, environment, and agriculture sectors, at national and local levels.

On April 15, 2010, the IRS operations were officially launched by Pr. Issifou Takpara, Minister of Health in Benin, Mr. James Knight, Ambassador of the United States in Benin, and Mr. Francois Houessou, Prefect of Ouémé-Plateau, during a ceremony at Ouanho warehouse. Afterward, the team visited a nearby warehouse, and the village of Gbedji, in Akpro-Misséréte commune, to better appreciate IRS operations (Figure 9).

Figure 9. Official Visit to IRS Operation



Officials visiting spraying operation in the village of Gbedji, in Akpro-Misséré-té commune.

3.1 Spray Operations and IEC Activities

The third round of IRS operations began on March 8, 2010, before the rainy season, in the four targeted communes of Adjohoun, Akpro-Misséré-té, Dangbo, and Sèmè-Kpodji, and ended on April 28, 2010, lasting for 44 days of spraying.

A total of 265 spray operators, divided in small team of six people, were deployed daily in the four communes to conduct spraying operations. In total, 29,227 sachets of 125 g bendiocarb were used to spray 166,910 structures out of 168,010 structures found. The total number of people were protected in all four communes was 636,448.

An MOH team, supported by representatives from MOENP and MAEP, supervised spray operations. The supervision team consisted of NMCP supervisors, hygiene agents from DDS, chief doctors, and a hygiene agent from DHAB.

Figure 10. IRS Spray Operators



Teams of IRS spray operators.

IEC activities were coordinated with spray operations. IEC mobilizers passed through each household 24–48 hours before the start of spray operations to remind residents about the spray schedule. During spray operations, each IEC mobilizer was responsible for visiting each assigned household in the village at least twice. Megaphone users and traditional gongonneurs reinforced IEC communication and supported IEC mobilizers during spray operations. On the day of spray operations, IEC mobilizers helped villagers to move their furniture out of their houses.

In addition to community mobilization, a news bulletin, *IRS Info*, initiated during the previous IRS round, was distributed throughout the spray operations to actors, beneficiaries, and others involved in IRS. This news bulletin highlighted key activities, progress made, and success stories that occurred during previous IRS rounds.

3.2 Monitoring and Supervision

3.2.1 Monitoring and Data Management

During the training phases, all of the data collection forms were revised and updated with the assistance of RTI trainers. Before the start of spray operations, trainers underwent practical exercises to improve their understanding of data management and guarantee a quality training to spray operators, team leaders, and group leaders to fill out the forms. Practice exercises and simulation in the field were done during the training of spray operators by hygiene agents and communes coordinators, with the technical support of RTI. Group leaders, team leaders, and spray operators completed data collection forms, which they would have to fill out on a daily basis during spray operations.

To ensure good quality in data collection by spray operators, the following three levels of supervision were established:

1. Team leaders checked the spray operators' forms each day.
2. Group leaders checked the team leaders' forms each day.
3. Commune coordinators checked all the forms from spray operators, team leaders, and group leaders. Then, they summarized the data collected into daily reports, which were sent to the data clerks for processing.

Four data clerks, one per commune, entered daily the data from the forms completed by all spray operators, using dedicated software designed for IRS by the senior M&E consultant. A system of data control was set up. All forms were filed per team and commune and all totals were recalculated. Data from spray operators and from team leaders were entered separately, checked, and then reconciled to ensure total agreement for each variable. Afterward, the senior M&E consultant completed an M&E spreadsheet, the country master tracker (CMT), detailing the data collected on the standard PMI indicators (coverage, protection, and utilization). This CMT was sent every two days to IRS partners and to the RTI Nairobi Regional Office for information and verification. A weekly M&E report is also produced and sent to the Nairobi Regional Office.

Throughout the spray operations, IEC mobilizers were supervised by 28 chiefs health post (CHPs) supported by the four medical chief doctors. The CHPs coordinated the IEC mobilizers and gave them the IEC data form. Data collection was controlled at two levels. The CHPs checked daily the data forms filled out by IEC mobilizers and summarized the results into daily reports. Data forms were then sent to the IEC consultant for checking. Afterward, data clerks entered the data for treatment and analysis by the senior M&E consultant. A total of 2,357 data forms, out of 2,500 sent to the field, were filled out and collected. Daily supervisions by CHPs remained also a challenge due to their workload constraints occasioning lack of availability for close supervision. This important problem will be addressed in the next round of spray.

During Round 3, no environmental consultant was recruited. The environmental monitoring was done by Dr. Issac DOVOEDO from DDEPN, with the support of the RTI logistic officer. Environmental monitoring tracked the following three components to ensure compliance with regulations:

1. Human health, by evaluating the impact of spraying on the population and fauna.
2. Transportation, determining if drivers were transporting the commodities according to the environmental rules and guidelines.
3. Management of waste, by evaluating the degree to which sprayers, cleaners, service technicians, and other individuals participating in spray operations followed waste management guidelines.

3.2.2 Supervision

Supervisors at central, regional, and commune levels monitored IRS operations throughout the 44 days of spraying operations. The following partners from NMCP, DDS, DHAB, MS, and MOENP, MAEP, including hygiene agents, were involved in monitoring IRS operations:

- Three days of supervision per week: (1) 13 representatives of NMCP and DHAB at national level; (2) the Director of DDS; (3) the Chief of SPPS; (4) the Chief of SEP; (5) the two IEC/NMCP representatives at the regional level; and (6) the three health zone coordinators of Ouémé who worked three days every two weeks.
- Three days of supervision per week and involvement in planning, coordination, and monitoring of IRS activities: The four medical chief doctors of targeted communes; the Chief of SHAB of Ouémé region; representatives from DAGRI/MAEP and DDEPN worked with RTI for environmental compliance with regulations.
- Constant supervision during spray operations: The medical support doctor (Medecin d'Appui) from NMCP at regional level worked on planning, coordination, supervision, and monitoring of IRS; 29 hygiene agents worked rotating two-week shifts on supervising IRS and facilitating community mobilizations.

A debriefing was held every two days at the main warehouse at Ouanho with the IRS the operational phase with the chiefs of regional services of the MOH and all supervisors.

3.3 Logistics

3.3.1 Warehousing: Storage of Commodities

In order to respect environmental and population health safety, the two warehouses (Ouanho and Adjohoun) are fenced and located far from markets, urban centers, schools, and water installations. In addition, access to the facilities is strictly forbidden to unauthorized persons.

The premises of both warehouses are guarded by security personnel 24 hours a day. The design of gates and the fencing system prevents domestic animals from entering the area. Warehouse doors are protected by a double-lock system. Fire extinguishers were placed in the two warehouses 1.5m from the floor. Temperatures in the warehouses were checked three times daily (morning, afternoon, and evening). All products and equipment in the warehouses were stored on pallets to protect them from moisture and heat (Figure 11). Following compliance rules, pallets were placed 1m away from the wall to allow proper air circulation. Contaminated solid wastes were stored separately from other IRS PPE and spray equipment.

Figure 11. Insecticide Storage



Insecticide storage at the central warehouse at Ouanho.

3.3.2 Transportation

During the 44 days of spray operations, 33 buses with a capacity of 18 people each were divided in the communes (11 to Sèmè-Kpodji, 8 to Akpro-Missérété, 8 to Adjohoun, and 6 to Dangbo). Vehicles were deployed each morning to transport spray operators residing in the communes of Akpro-Missérété, Dangbo, and Sèmè-Kpodji to the central warehouse at Ouanho to retrieve their spray equipment and begin the activities of the day. Vehicles attributed to Adjohoun were deployed each morning to transport workers from their homes to the second warehouse at Adjohoun. Two teams of six spray operators occupied each vehicle. Departure time from warehouses to the field was 7:00 a.m., with a 1:00 p.m. return time to the warehouses. Spray operators then dropped off their equipment and washed up before returning to their respective communes. Maintenance technicians worked alongside spray operators to conduct on-

the-spot repairs of compression sprayers. Forms were used to track transportation, fuel consumption, and mileage. Vehicles were parked at the central warehouses at Ouanho at the end of each day.

3.4 Health and Environmental Safety

The use of insecticides in IRS operations poses potential risks for spray operators, other IRS staff (cleaners, logistic assistants, service technicians, RTI staff, supervisors, drivers, data clerks), visitors of activities, beneficiaries, and the environment. Several measures were taken at different levels to prevent any possible negative effects.

3.4.1 Staff Protection

IRS participants were trained on the proper handling of bendiocarb, as well as the precautions to take during spray operations, in the field and at the warehouses, and how to manage in case of intoxication. Each spray operator, cleaner, driver, and logistic assistant was equipped with PPE, consisting of a long-sleeved shirt, a helmet with face shield, a respiratory mask, a pair of robust boots, and durable gloves. All staff had to be dressed in PPE and were prohibited from eating, drinking, and smoking during working hours in order to avoid skin contamination, inhalation, and insecticide ingestion.

All IRS personnel were trained on actions to take in the event of accidental pesticide contact with the skin, eyes, or the environment. These actions include informing commune coordinators working in the field of such events to ensure that the affected person is sent to a health center where first aid kits are available. Each commune coordinator carried a first aid kit in his or her vehicle at all times.

3.4.2 Beneficiaries Protection

Specific guidelines were provided to communities to prevent the beneficiary populations and the surrounding environment from possible contamination of the insecticide, including:

- Moving all household items outside, or placing items that are too large or heavy to transport in the center of the room and covering them with plastic sheets.
- Moving all domestic animals outside.
- Moving fishing and fish breeding engines outside.
- Staying outside during the spray operations.
- Remaining outside for at least two hours after spraying and leaving doors and windows open for at least one hour after reentry.
- Sweeping rooms, gathering dead insects, and disposing of them in a hole.

Figure 12. Protecting Beneficiaries from Contamination



A kitten covered in a basket for protection.



Cooking facilities being removed from a house to be sprayed.

3.4.3 Environmental Protection

From March 27 to April 10, 2010, a mid-spray inspection was conducted by Mr. Autman Tembo, Environmental Specialist at RTI Nairobi Regional Office. Mr. Tembo made a follow-up on the implementation of recommendations made during the pre-spray visit, observed IRS activities to ascertain their environmental compliance, and provided field support to the IRS program for the improvement of quality of spraying.

Both central and secondary warehouses (Ouanho and Adjohoun) are fenced and strictly forbidden to unauthorized persons. Rinsing areas and soak pits, which collect contaminated water, were built away from fences wall.

At the end of each working day, each spray operator cleaned his or her spray pump using the progressive rinsing system put in place. Afterward, he/she gave the pump and PPE to the commune logistic assistant to be washed. The cleaner washed the PPE and equipment daily.

The water used to rinse spray pumps at the end of the day was reused the next day to save water and reduce the potential for pollution from contaminated rinse water. The progressive rinsing system (Figure 13) is known as a best practice for rinse water reuse. It involves a row of seven drums of approximately 200 liters each. The first container is empty as are the third, fifth, and seventh, while every other container is filled with clean water. During clean up, any insecticide remaining in the pump (usually a limited volume, because most sprayers return from the field with empty pumps) is emptied into the first container. The spray operator then fills the sprayer less than half full with water from the second container; closes and shakes the sprayer; and dumps the water into the third container. The spray operator repeats the same steps with the fourth and fifth containers, and the sixth and seventh containers, making sure that on the sixth and seventh containers, the pump is pressurized to clean the discharge system. The following day, the pumps are filled with liquid from containers in the same sequential order: container one, then container three, then container five. The remaining liquid in the fifth and seventh containers is highly diluted and is disposed of in soak pits.

Figure 13. Progressive Rinse



Progressive rinsing system in use.

At the end of each day, empty sachets were collected by the commune group leader, recorded on M&E forms, and given to the commune logistician in the presence of the logistics manager. Both logisticians counted the empty sachets and sealed them in barrels. All solid waste, including masks and gloves, were also sealed in barrels. As per environmental rules and regulations, different types of wastes were sealed in different barrels. All solid waste will be incinerated. Forms used to keep track of commodity movement in the field and between the central warehouse and commune storage sites were also used to quickly detect any loss, misplacement, or dysfunction of any spray equipment.

4. Post-spray Activities

4.1 Logistics

4.1.1 Equipment

At the end of spray operations, all of the used PPE was washed (Figure 14) and stored in the central warehouse, and spray pumps were stored according to recommendations of FAO and WHO regarding pesticide management and storage regulations. All PPE equipment and materials from Adjohoun warehouse were returned to the central warehouse at Ouanho.

Figure 14. PPE Washing



Washing of PPE in the central warehouse at Ouanho.

To ensure adequate equipment conservation until the next round of spraying, logistic assistants and service technicians thoroughly rinsed, examined, and lubricated the pumps. Twelve pumps, out of 265 used during this round, were defective, and will be repaired. Afterward, all pumps in good condition were properly hooked to the wall in the central warehouse, following recommendations from FAO.

An internal financial/logistic audit was conducted by an RTI team (the finance manager, logistics manager, and operations coordinator) under supervision of the COP to check inventory and stock cards management. All items were counted one by one for reconciliation between physical and expected inventories. The inventory books were then closed for this round. The remaining stock for materials and equipment will be used in a future spray round. Table 11 shows the stock remaining at the end of IRS Round 3.

Table 11. Stock Remaining

Item	Unit	Stock Remaining
Pump	Unit	571
Boots	Pair	527
Helmet	Unit	521
Coverall	Unit	1,691
Gloves	Pair	4,776
Respiratory mask	Unit	17,748
Insecticide (Ficam VC)	Sachet	29,178

4.1.2 IRS Waste Disposal

The IRS team prepared the waste to be incinerated at the Central Hospital Department (Centre Départemental Hospitalier) of Ouémé Plateau in Porto Novo. The operation of incineration is planned to be conducted at the end of June 2010. The waste is now stored at the central warehouse at Ouanho.

This operation (which focused on the incineration of empty sachets of FICAM VC, respiratory masks, and gloves) will be supervised by the ABE, the Directorate of Hygiene, NMCP representatives, and the IRS team. The operation will be executed in the following three stages:

1. **Transportation of waste:** In accordance with environmental safety regulations, all IRS waste will be transported in a vehicle from the central Ouanho warehouse to the incinerator at Porto Novo. The different types of wastes are stored in sealed barrels and will be carefully arranged in the vehicle that will be tightly closed with tarpaulin. All IRS waste will be shipped in this manner and under the supervision on the operations manager.
2. **IRS waste loading and unloading:** Loading and unloading of IRS waste will be conducted by a team of experienced workers. In order to avoid contamination while moving the barrels and empty sachets, these workers will be all provided with PPE and informed of the type of insecticide used during spray operations (FICAM VC).
3. **IRS waste incineration:** Prior to incineration, the storage barrels will be progressively cleaned on plastic sheets and the waste will be packaged by workers in small plastic bags in order to facilitate incineration. Before the start of each work day, hospital technicians will preheat the incinerator to higher than 1,000°C. As soon as this temperature will be exceeded, the waste will be loaded into the incinerator load by load until the end of the day.

All the workers in charge of loading and unloading the waste will abide by hygiene and security rules during the operation, including wearing PPE, handling waste barrels in a safe manner, and washing their hands with soap and water at the end of each day before wearing their clothes.

The waste to be incinerated during this IRS Round 3 is as follows:

- 29,227 empty sachets
- 7,298 used respiratory masks
- 1,025 used pairs of gloves
- 184 used spray operators bags

4.2 IEC

After spray operations, RTI IEC consultant and IEC mobilizers came back to the villages for interviewing beneficiaries on IRS activities performed in their houses. They collected information on the population's satisfaction, IRS activities performance, support and communication received, problems encountered, and their expectations for a future IRS round. The IEC consultant could also check the

efficiency of IEC mobilizers during IRS operations. IEC results are presented in this report.

4.3 CREC

The CREC was tasked to assess the efficiency of IRS operations in the four targeted communes. CREC conducted monitoring visits in the four communes to control the quality and homogeneity of the spraying by spray operators and to monitor entomological activities for vector sensibility and insecticide durability on different sprayed surfaces. Field visits (60 at the time of the report) occur during and after spray operations. The process is ongoing and a report, written by CREC on these monitoring visits, will be available in the coming weeks.

CREC was provided in 2008 with PPE and spray pumps to conduct their activities during the three rounds of spray.

4.4 IRS Operations Closing Ceremony

On April 28, 2010, a closing ceremony was conducted at the central warehouse at Ouanho. The IRS Round 3 operations were officially closed by Dr. Hubert DEDJAN, Director of DDS at Ouémé-Plateau. Representatives from USAID/PMI and MOH, at regional and local levels, attended this meeting.

5. IRS Round 3 Results

IRS operations lasted 44 days, including the technical operations launch day. In total, 136 villages were sprayed in the four targeted communes: 40 villages in Adjohoun, 40 villages in Akpro-Misséré-té, 18 villages in Dangbo, and 38 villages in Sèmè-Kpodji.

Every day during IRS operations, spray operators and their teams and group leaders were required to fill out data forms for data collection. In total, 12,927 data forms were filled out and entered for this spray round: 246 spray operators' forms (as team leaders also sprayed), 41 team leaders' forms, and 19 group leaders' forms. These forms were filled out, collected, and entered daily. A new IEC data form, using pictures, was created and tested during this spray round to evaluate quality and quantity of work performed by IEC mobilizers in the field and to improve IEC data collection. In total, 2,357 data forms, out of 2,500 distributed, were used by IEC mobilizers, collected by the IEC consultant and entered for treatment and analysis. Also, hygiene agents, who were responsible for closely supervising spray operations, completed 600 supervision forms.

5.1 Spraying Results

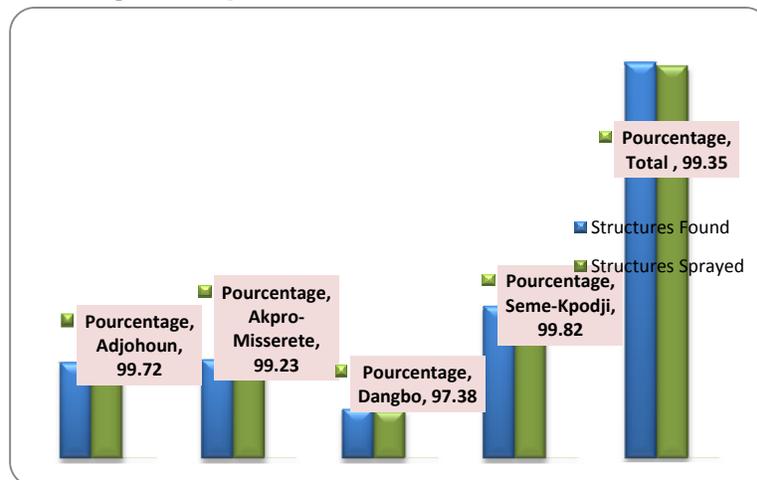
5.1.1 Coverage

In IRS Round 3, out of 168,010 structures found, 166,910 structures were sprayed, representing a coverage rate of 99.35%. Figure 15 shows the coverage rate for each commune.

The IRS coverage rate is the percentage of sprayable structures found in the target area that were sprayed (Figure 15). A sprayable structure is defined as a free-standing building in which people sleep. This ratio is calculated as followed: the numerator is the number of structures sprayed by spray operators, and the denominator is the number of structures found by spray operators. The target is 85% of the sprayable structures in the area(s) to be sprayed.

To get the global statistical coverage of structures per commune, an exhaustive survey combined with a complete cartography of structures should be done at least two months earlier than the starting of spray operations. Spray operators (and eventually IEC mobilizers) would also have to be trained in map reading in general and in geographical recognition of structures on the field in particular. It is important to note also that all structures are not necessarily eligible for spraying (e.g., structures in flooding zone).

Figure 15. Coverage Rate per Commune - IRS Round 3 in 2010



The current IRS coverage rate for this round is similar to the previous IRS round in 2009, which was 99%. However, the number of structures found and sprayed this round is higher compared with 2009 (156,233 structures sprayed in 2009).

Explanations of this situation could be as follows:

- The population of the four targeted communes is now totally convinced of the efficiency of IRS to prevent malaria.
- The decongestion of the two main cities (Cotonou and Porto-Novo) in benefit to the surrounding communes has been due to an increasing number of structures found, and indirectly an increasing number of the population benefiting from IRS (see Population Protected below).
- The geographical coverage of villages is not exactly the same as in previous spray rounds: Some rural communities in very remote and difficult to access areas were identified earlier this year by IEC mobilizers and planned to be sprayed (e.g., hamlet of Akpachrame in Koudjanada village, Ahouandji in Kpanoukpade village from Zougborne borough).

- Better geographical knowledge of spraying areas and higher experience of IRS staff (most spray operators are the same as in previous rounds).

5.1.2 Population Protected

In IRS Round 3, the total population living in structures sprayed and now protected is 636,448 people. This higher number of protected population in comparison with 2009 (512,491 people protected) is due to similar reasons proposed in the coverage discussion.

The total number of pregnant women and children under five years of age protected by IRS are 47,947 and 88,912, respectively, in all four communes. The results by commune are displayed in Figures 16 and 17.

Figure 16. People Protected per Commune—IRS Round 3 in 2010

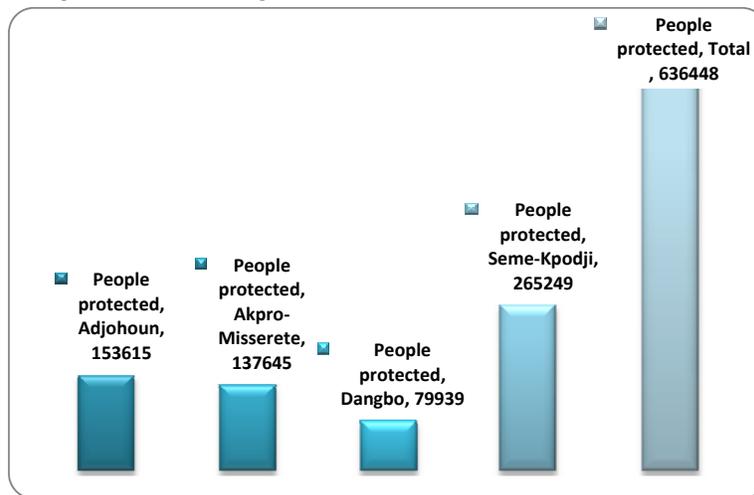
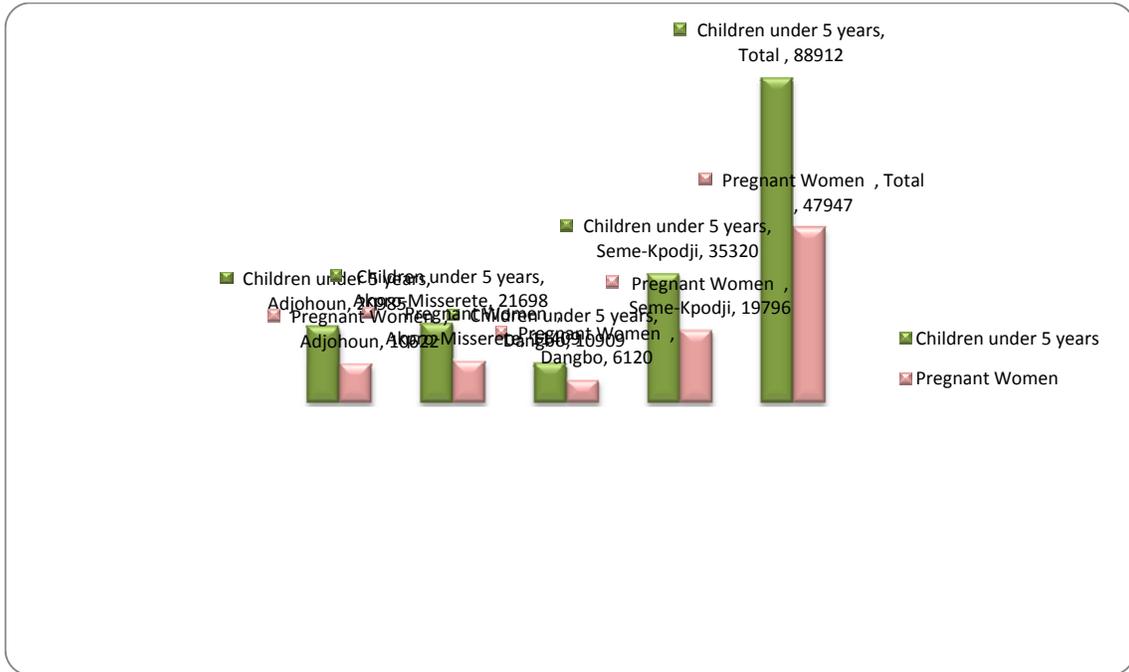


Figure 17. Pregnant Women and Children under 5 Years Protected—IRS Round 3 in 2010



5.1.3 Insecticides Used

A total of 29,227 sachets of insecticides were used to treat these 166,910 structures sprayed in this round. Average structures treated per sachet were 5.71. The distribution of sachets by commune is displayed in Figures 18 and 19.

Figure 18. Insecticide Use

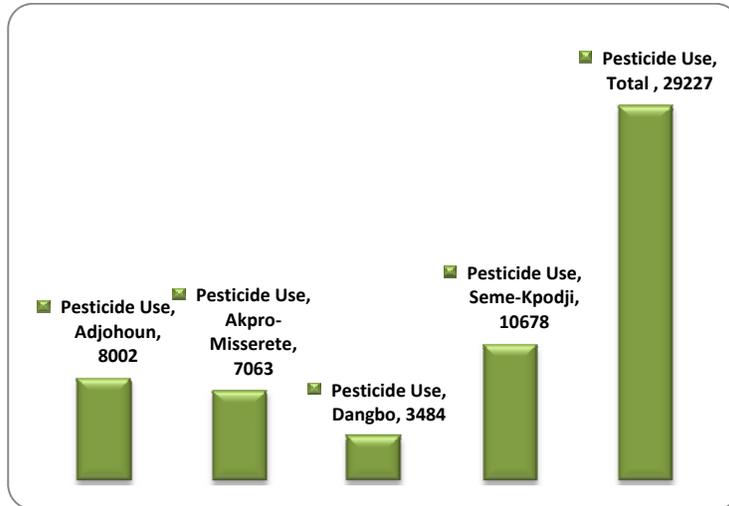
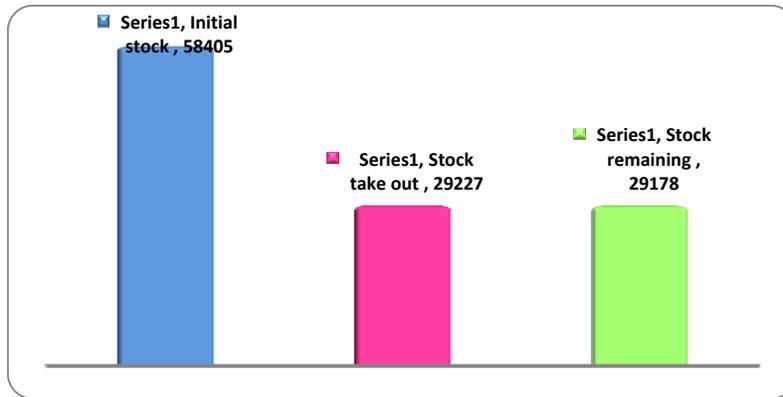


Figure 19. Insecticide Inventory



The remaining stock for insecticide is 29,178 sachets. This number is expected to be sufficient for conducting the next round of spray (Round 4) with similar objectives and in the same targeted communes in August–September this year.

5.1.4 Mosquito Nets Use

A total of 176,230 mosquito nets were declared by the population as existing in the structures visited. Out of 88,912 children under five years of age, 81,852 were declared sleeping under mosquito nets (92%). Out of 47,947 pregnant women identified, 46,074 declared sleeping under mosquito nets (96%). The results by commune are displayed in Figures 20 and 21.

Figure 20. Comparison between the Total of Pregnant Women and Children under 5 Years and Those Sleeping Under Nets

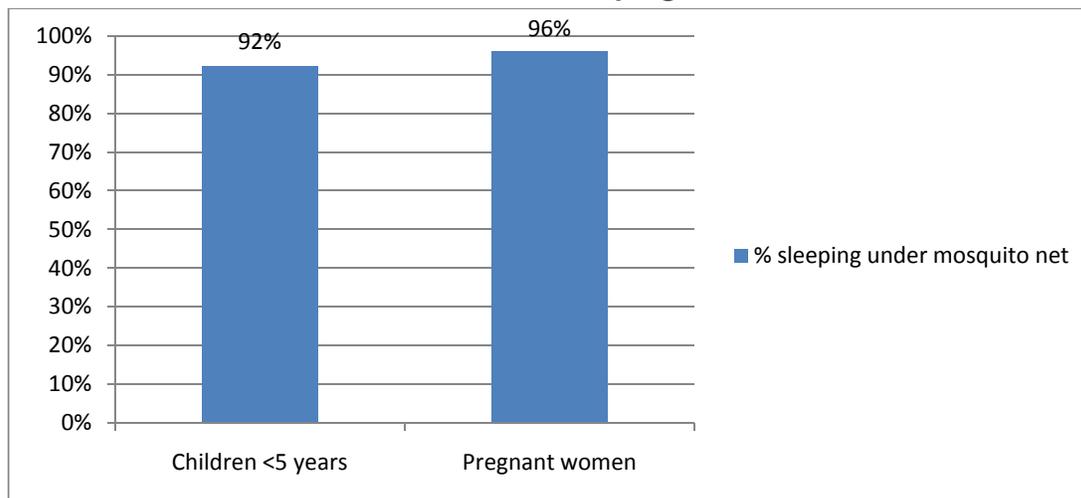


Figure 21. Pregnant Women and Children under 5 Years Sleeping Under Nets per Commune

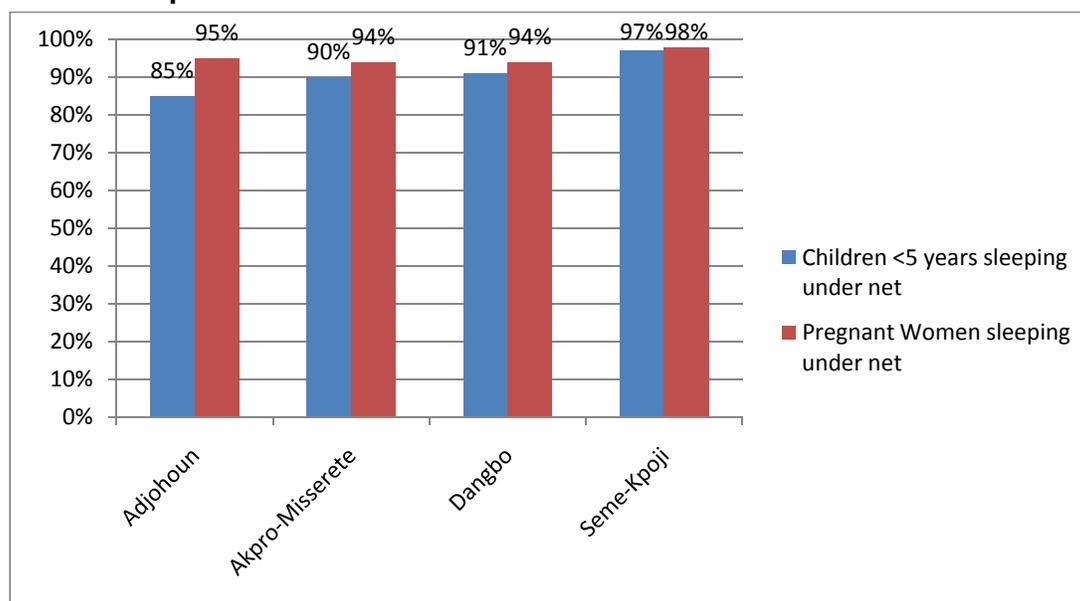


Table 12 summarizes the IRS Round 3 results.

Table 12. Coverage, Protection, and Use

Communes	Coverage Structures		Protection People Protected			Use			
	Visited	Treated	Total	Children Under 5 Years	Pregnant Women	Found	Nets		Pesticide
							Children Under 5 Years Sleeping Under Nets	Pregnant Women Sleeping Under Nets	Sachets Used
Adjohoun	40,526	40,413	153,615	20,985	10,622	40,684	17,884	10,065	8,002
Akpro-Misséréte	41,790	41,469	137,645	21,698	11,409	40,080	19,666	10,763	7,063
Dangbo	20,927	20,378	79,939	10,909	6,120	20,010	10,019	5,730	3,484
Sèmè-Kpodji	64,767	64,650	26,5249	35,320	19,796	75,456	34,283	19,516	10,678
Total	168,010	166,910	636,448	88,912	47,947	176,230	81,852	46,074	29,227

5.2 IEC Results Using New Data Form

The new IEC data form, using pictograms, was used by some of the IEC mobilizers for field testing (Table 13). In total, IEC mobilizers used 2,357 data forms, out of 2,500 distributed, which were collected by the IEC consultant and entered for treatment and analysis. The results obtained from this IEC data collection were:

- 16,747 households have been reached by these IEC mobilizers, representing 59,238 people (27,726 males and 31,512 females).
- 94% of these households accepted the IRS. The 6% remaining were visited later on by the CHPs to discuss the reasons of their refusal. The main reasons explained for refusal were: problem of furniture storage, sickness of one of the family members, fear of insecticide or doubt regarding its efficiency.

Table 13. IEC Test Data per Commune

Communes	Total of Forms Filled	Households Met	Refuse	Households Accepted	Percentage of Acceptance	Persons Met	Men	Women
Adjohoun	529	3.651	140	3.511	96%	15,787	7,238	8,549
Akpro-Misséréte	704	4.450	154	4.296	97%	18,471	8,245	10,226
Dangbo	479	2.432	94	2.338	96%	7,520	3,766	3,754
Sèmè-Kpodji	645	6.214	574	5.640	91%	17,460	8,477	8,983
Total	2.357	16.747	962	15.785	94%	59,238	27.726	31.512

5.3 Results of the Supervision

The role and responsibility of supervisors were to monitor the respect of hygiene and safety rules by the IRS staff and the correct uses of PPE during spray operations, and to report the correct notification to the population informing about the spray operators passage according to time scheduled.

Supervisors' reports showed that the majority of IRS spray operators (98.94%) correctly and regularly used PPE, respected the hygiene and safety rules during spray operations, and gave appropriate advices to the population.

Most of the population in the four targeted communes declared to have been correctly and soon enough informed on the arrival of spray operators, via local radio stations, IEC mobilizers, traditional gongonneurs, and/or megaphone users.

5.4 Results of the Environmental Monitoring

IRS environmental monitoring was conducted jointly by the RTI Logistic officer, the representative of DDEPN and the representative of DAGRI. They were also supported by the RTI Environmental Specialist based at the Nairobi Regional Office. Out of 2,483 sprayed rooms that were inspected, 2,333 rooms (93.96%) were deemed compliant.

There were no reports of adverse effects due to insecticide contamination throughout the entire spray operations.

6. Lessons Learned and Recommendations

Lessons learned for this IRS Round 3 are as follows:

- The new IEC data collection form with pictures, created this round, was tested by some IEC mobilizers in the field. This data form was more easily used by IEC mobilizers and has provided some quantitative IEC data.
- The flexibility in scheduling spray operators' activities by considering local activities and events (e.g., working hours in fluvial regions, market day, village's celebrations, etc.) provided excellent results in avoiding household absenteeism during spray operations.
- Hiring megaphone users on motorbike and traditional gongonneurs improved IEC activities and facilitated community mobilization, especially in remote areas.
- The chiefs of health post, who were responsible for IEC mobilizers supervision and coordination, encountered problems performing close and good quality supervision and coordination due to their heavy workload and others activities.
- IRS spray operations were supervised by different services (MOH and MOENP) at different levels (national, regional, and local). Different supervisors came at different times for supervisory visits. Some of them had little knowledge of IRS, especially in terms of spraying techniques or environmental regulations. Therefore, sometimes gave different or contradictory directives to the operators and the population (beneficiaries).
- Logistic procurement of insecticide and IRS equipment encountered problems in purchase order follow up, causing delays in delivery and serious stress on starting spray operations in time. Pre-spraying coordination between in-country team, RTI suppliers, and the home office is needed to track insecticide order for timely arrival in country.
- Prolonged absence (close to six months) of a COP constitutes a major challenge in the above-noted coordination that is required for pre-spraying activities.
- M&E tools, such as Country and Communes Master Tracker and the introduction of M&E chapter in the training guide, have improved the IRS data monitoring and quality assessment.
- Logistic management tools, such as new stock cards, insecticide barrel coding system and "Ficam tracking," have improved the daily supervision and coordination for better quality insurance and control in logistic and environmental aspects of spray operations.
- The RTI financial team has improved the payment system for seasonal workers (spray operators, cleaners), introducing fortnight payment (reducing cash advance requests) and payment by check (increasing security and transparency).

Based on these lessons learned, we recommend to

- Continue to test the IEC data collection form, using pictogram, in the next spray round, by introducing it at the early beginning of IEC activities (usually two weeks before spraying operations) and generalizing its utilization to all IEC mobilizers.
- Continue, when scheduling IRS activities, to take into account local activities and events in order to avoid household absenteeism during spray operations.
- Integrate megaphone users to the IRS IEC strategy and include them in the IEC training sessions.
- Review the level of daily implication of health post chiefs in IEC mobilizers' supervision, according to their workload and availability, by providing them with support staff during spray operations.
- Require, as possible, all actors involved in supervision activities to participate in the TOT IRS training session to avoid contradictory directives to IRS field teams and residents of targeted villages.
- Improve communication and implement purchase order follow up system to avoid future problems in logistic procurement.
- Continue to improve the M&E system and data quality assurance (DQA) by generalizing, as possible, the utilization of the IRS standard indicators in data collection by spray operators and IEC mobilizers.
- Increase the responsibility and accountability level of team and group leaders to ensure constant follow up of IRS security rules and PPE management supervision of the spray operators.
- Require from all seasonal workers official identity documents before starting IRS operations and pay all supervisors via direct bank transfer.

Annex I: Structures and Population Protected, per Week

Week	Structures Found	Structures Sprayed	Population in Structures Sprayed	Children <5yrs	Pregnant Women
1	7132	7,087	43,682	6,632	3,018
2	12,086	11,970	74,608	9,962	5,503
3	12,877	12,808	84,021	11,226	6,134
4	20,538	20,415	90,876	12,710	6,951
5	26,308	26,088	85,785	12,235	6,770
6	32,540	32,251	94,122	13,431	7,224
7	38,298	38,127	110,163	15,315	8,289
8	18,231	18,164	53,191	7,401	4,058
All weeks	168,010	166,910	636,448	88,912	47,947

Annex II: IRS Sustainability Plan

Activity	Proportional Responsibility (%)							
	Round 1 (2008)		Round 2 (2009)		Round 3 (2010)		Round 4 (2010)	
	MOH	RTI	MOH	RTI	MOH	RTI	MOH	RTI
Partnership Development								
Establish IRS oversight committee	50	50	80	20	90	10	90	10
Environmental Compliance								
Conduct an environmental assessment	0	100	20	80	50	50	80	20
Prepare an environmental monitoring plan	0	100	20	80	40	60	50	50
Conduct an environmental compliance inspection	0	100	10	90	20	80	50	50
Entomological Surveillance								
Identify and train entomological technicians	100	0	100	0	100	0	100	0
Perform baseline survey	100	0	100	0	100	0	100	0
Conduct periodical surveys	100	0	100	0	100	0	100	0
IEC Program								
Carry out informational research	0	100	50	50	90	10	90	10
Train IEC mobilizers	0	100	50	50	70	30	90	10
Develop IEC materials	0	100	10	90	20	80	40	60
Conduct Pre-IRS IEC mobilization activities	10	90	50	50	70	30	90	10
Coordinate IEC during IRS	0	100	50	50	70	30	90	10
Perform post-spray IEC survey	10	90	40	60	50	50	50	50
Logistics Procurement and Management								
Conduct field visit to perform logistics needs assessment	10	100	50	50	60	40	60	40
Conduct procurement	0	100	0	100	0	100	0	100
Carry out logistics distribution and delivery	0	100	10	90	50	50	50	50
Perform micro-planning	30	70	50	50	50	50	50	50
Maintain logistics chain of custody	0	100	10	90	30	70	30	70
IRS Operations								
Conduct geographical reconnaissance	10	90	20	80	40	60	40	60
Conduct training of trainers and of sprayers	0	100	20	80	20	80	20	80
Organize spray operations campaign	40	60	20	80	20	80	20	80
Carry out post-spray activities	50	50	50	50	80	20	80	20

Annex III: IEC Tool: “PID Info” (ceremony of the official launch of IRS operations)

INFOS DE LA PID AU BENIN

Année 3 2010
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Cyrille VITO

Dans ce numéro
La PID round 3 lancée par l’Ambassadeur des USA, le Ministre de la Santé et le Préfet de l’Ouémé Plateau







Le jeudi 15 Avril 2010, la grande base des opérations de Pulvérisation Intra Domiciliaire (l’entrepôt de Ouanho dans la commune d’Avrankou) a connu la visite conjointe de trois hôtes de marques venus non seulement pour le lancement officiel de la PID round 3 mais aussi pour observer le déroulement des opérations dans les communes.

Il s’agit de son Excellence l’Ambassadeur des USA près le Benin Mr JAMES KNIGHT, le Ministre de la Santé du Benin le Dr Issifou TAKPARA et le Préfet des départements Oueme Plateau Mr. HOUESSOU François.

A 9h30 minutes, l’aire de l’entrepôt était comble de monde.

L’ambassadeur, était accompagné de toute son équipe technique et de la Directrice de l’USAID Mme Janet SCHULMAN aux cotés de qui se trouvait son directeur Affaire santé le Dr. Milton B. AMAYUN

Le Ministre de la Santé était suivi par une importante équipe composée des cadres du PNL, du Directeur Départemental de la santé le Dr. Hubert DEDJAN et de son parterre de collaborateurs au niveau départemental. La première étape de la cérémonie était la revue des troupes avec des chants et danses bien ordonnées et disposées en 8 groupes. :Quatre groupes d’opérateurs ; deux de 90 disposés dans la cour de l’entrepôt et deux autres groupes de 20 opérateurs disposés au niveau de l’aire de rinçage progressif, un groupe de 25 relais communautaires venus monter la primauté de l’IEC dans la stratégie de communication dans la PID, un groupe de 20 lingères, un de 27 chauffeurs et enfin le groupe des huit Assistants d’hygiène détachés du service publique pour le contrôle de qualité de la PID.

L’étape suivante fut celle des allocutions démarrées d’abord par Mr. HOUESSOU François Préfet des départements Oueme Plateau. Celui-ci après avoir remercié les gouvernements américain et béninois pour avoir accepté démarrer la phase pilote de la PID dans ces quatre communes de son département a félicité tous les acteurs a divers niveaux pour le travail qui s’abat quotidiennement sur le terrain.

L’ambassadeur quant à lui a mis l’accent sur la collaboration entre les deux gouvernements au profit des populations béninoises.

Le Ministre de la santé est venu clôturer le bal des discours en reconnaissant les efforts que déploient tous les acteurs à tous les niveaux dans la mise en œuvre et l’exécution de la PID dans l’Ouémé pour terminer sur le fait que tout le dispositif trouvé sur place démontre de la justification de la bonne utilisation du financement PMI au Benin.