



PRESIDENT'S MALARIA INITIATIVE



INDOOR RESIDUAL SPRAYING FOR MALARIA CONTROL

Semiannual Report

Indoor Residual Spraying (IRS 2) Task Order One

October 1, 2009–March 31, 2010

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The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

Acronyms

ACT	Artemisinin-based combination therapy
ADEMAS	<i>Agence pour le Développement de Marketing Social/Agency for the Development of Social Marketing</i>
AED	Academy for Educational Development
ASACO	<i>L'Association de Santé Communautaire/Community Health Association (Mali)</i>
BCC	behavior change communication
CAME	Coalition Against Malaria in Ethiopia
CAMERWA	Rwanda Drug, Consumables and Equipment Central Procurement Agency
CA-USA	Crown Agents USA, Inc.
CCF	Christian Children's Fund
CCM	Country Coordinating Mechanism
CCN	Cooperating Country National
CDC	U.S. Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
CILSS	<i>Comité Inter-Etat de Lutte Contre la Secheresse dans le Sahel, Interstate Committee for Drought Control in the Sahel (Burkina Faso)</i>
CLD	Local Development Committee
COP	Chief of Party
COTR	Contracting Officer's Technical Representative
CPM	Chiefs of Medical Posts
CREC	<i>Centre de Recherche Entomologique de Cotonou/Entomological Research Center of Cotonou (Benin)</i>
CS	capsule suspension
CSCOM	<i>Centre de Santé Communautaire/Community Health Center (Mali)</i>
CSPS	<i>Centres de Santé et Prévention Sociale (Burkina Faso)</i>
CSREF	<i>Centre de Santé de Référence/Referral Health Center (Mali)</i>
DC	district council
DCMO	District Chief Medical Officer
DDS	<i>Direction Départementale de la Santé</i>
DDT	dichloro-diphenyl-trichloroethane
DEEC	<i>Direction de l'Environnement et des Etablissements Classés (Environment and Classified Factories Directorate)</i>
DHPEPS	Directorate of Hygiene and Health Education (Burkina Faso)
DHMT	district health management team
DHO	district health offices
DHT	district health team
DPS	<i>Departamento Provincial de Saúde/Provincial Department of Health (Mozambique)</i>
DPV	Plant Protection Directorate
DRACPN	<i>Direction Régionale de l'Assainissement et du Contrôle de Pollution et des Nuisances/Regional Directorate of Sanitation, Pollution, and Nuisance Control</i>
ECZ	Environmental Council of Zambia
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency

FAO	Food and Agriculture Organization of the United Nations
FM	finance manager
FMOH	Federal Ministry of Health (Ethiopia)
FY	fiscal year
GF	Global Fund
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GHS	Ghana Health Service
GPS	global positioning system
GR	geographical reconnaissance
GSCP	Ghana Sustainable Change Project
HCC	health communication center
HCG	human gonadotropin
HIV	human immunodeficiency virus
ICON [®]	lambda-cyhalothrin
ICP	Health Post Head Nurse
IEC	information, education, and communication
INS	<i>Instituto Nacional de Saúde</i> /National Institute of Health (Mozambique)
IPCM	inventory and property control management
IPM	<i>Institut Pasteur de Madagascar</i>
IPT	intermittent preventive treatment
IQC	Indefinite Quantity Contract
IRS	indoor residual spraying
ITN	insecticide-treated net
IVM	integrated vector management
KCCR	Kumasi Centre for Collaborative Research (Ghana)
LATH	Liverpool Associates for Tropical Health
LEVP	Lev Pharmaceuticals, Inc.
LLIN	long-lasting insecticidal net
LOE	level of effort
M&E	monitoring and evaluation
MCHIP	Maternal and Child Health Integrated Program
MEO	USAID Mission Environmental Officer
MEWS	Malaria Early Warning System
MOE	Ministry of Environment
MOH	Ministry of Health
MOHFP	Ministry of Health, Family Planning and Social Protection (Madagascar)
MOP	Malaria Operational Plan
MOU	Memorandum of Understanding
MRC	Malagasy Red Cross
MRL	Minimal Residual Level
MRTC	Malaria Research Training Center
MSF	Médecins Sans Frontières
NEMA	National Environment Management Authority
NGO	nongovernmental organization
NMCC	National Malaria Control Centre (Zambia)
NMCP	National Malaria Control Program
NMIMR	Noguchi Memorial Institute for Medical Research (Ghana)
ORHB	Oromia Regional Health Bureau (Ethiopia)

PASP	Programme Africain Relatif aux Stocks de Pesticides/African Program on Pesticide Stocks
PDA	personal digital assistant
PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
PID	<i>Programme Africain Relatif aux Stocks de Pesticides</i> /African program on Pesticide Stocks
PMI	United States President's Malaria Initiative
PNILP	Programme National Intégré de Lutte contre le Paludisme/National Integrated Malaria Control Program (Rwanda)
PNLP	Programme National de Lutte contre le Paludisme/National Malaria Control Program (Benin, Senegal)
PPE	personal protective equipment
PSI	Population Services International
RBM	Roll Back Malaria
RTI	RTI International
SEA	Supplemental Environmental Assessment
SLAP	<i>Service de Lutte Anti-Parasitaire</i> /Pesticide Control Service (Senegal)
SLP	<i>Service de Lutte Contre le Paludisme</i> /National Malaria Control Program (Madagascar)
TDY	temporary duty
TO	task order
TOT	training of trainers
UCAD	<i>l'Université Cheikh Anta Diop</i>
UGP	<i>L'Unité de Gestion du Programme</i> /Program Management Unit (Madagascar)
UNZA	University of Zambia
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization
WHOPES	WHO Pesticide Evaluation Scheme
WP	wettable powder

Introduction

RTI International is pleased to submit this semiannual report for the Indoor Residual Spraying (IRS 2), Task Order One, under Contract No. GHN-I-01-09-000012-00. On September 30, 2009, RTI and its partners, the Medical Research Council (MRC), Crown Agents-USA (CA-USA), and the Meridian Group (MG) were awarded the IRS 2 Task Order One contract with a ceiling of \$101,603,641. A total of obligation of \$19,810,928 was made during the first six-month performance period (October 1, 2009–March 31, 2010).

Funded by the United States President’s Malaria Initiative (PMI), the purpose of the IRS project is to support PMI countries in planning and implementing IRS programs with the overall goal of reducing the burden of malaria in Africa. The specific goal is to support National Malaria Control Programs (NMCPs) to reach a minimum of 85% of the vulnerable population living in selected high burden malaria regions with a safe and highly effective application of insecticide inside homes. This IRS 2 Task Order One (TO1) has the following five main components:

1. Cost-effective procurement and logistics systems for IRS;
2. Support for NMCPs to implement IRS programs through the provision of operational management, planning, and administrative assistance; competitively procured IRS commodities; field supervision; and short- and long-term technical assistance;
3. Environmental compliance and the safe use of insecticides;
4. Build and strengthen the capacity of NMCPs to carry out all aspects of IRS at the central, provincial, and district levels; and
5. Provide ongoing monitoring and evaluation for IRS activities, and ensure quality control measures are in place and implemented.

This report provides an overview of activities from January 1 through March 31, 2010, in each of the 11 countries included under IRS 2 TO1: Angola, Benin, Burkina Faso, Ethiopia, Ghana, Madagascar, Mali, Mozambique, Rwanda, Senegal, and Zambia. These country reports focus on the period January–March 2010, because a separate quarterly report covering the period October–December 2009 was submitted January 31, 2010, as IRS activities shifted from the previous Indoor Residual Spraying (IRS) Indefinite Quantity Contract (IQC) to the IRS 2 TO 1.

During this first coverage period for IRS 2 TO1, all country programs focused on the procurement of insecticide, protective equipment, and supplies, as required for 2010 spray rounds. The first set of country spray campaigns are set to begin in early May 2010, and country teams have completed all necessary inspections and training of trainers in Burkina Faso, Benin, Mali, and Ghana. Burkina Faso is a new IRS 2 TO1 country, with a pilot to cover about 25,000 households in one district. Preparing for spray operations has involved collaborative planning between RTI country project teams and the NMCP/National Malaria Control Center (NMCC), District Health Management Teams (DHMTs), and local assemblies to coordinate expansion into new districts, entomological monitoring and training, as well as securing office space, warehouses, storerooms, and soak pit sites for the spray operations.

Core Activities

A description of the project management structure and key activities taking place under the CORE work plan are described in the section below. This is followed by a summary of key activities and accomplishments during this period.

A central feature and change under IRS 2 is the decentralization of project management, administrative, and technical responsibilities to the Nairobi Regional Office as reflected in the approved CORE work plan and organizational chart. The new Project Director, John Chimumbwa, was approved, and recruitment of two key personnel positions—Finance and Administration Director and Deputy Director-Country Operations Support—is underway. The Environmental Compliance team, technical advisory staff, finance, procurement, and administrative staff in the Nairobi office are in place. Subcontract agreements with our partners, CA-USA, MRC, and MG, have been concluded. One of two staff hires (Resistance Management Specialist) under the MRC scope of work has been hired, and recruitment is underway for a Training Specialist. Under our subcontract with MG, an Information, Education, and Communication Specialist has been hired. Under our subcontract with CA-USA, a Procurement Advisor has been hired. A Procurement Manager position, currently residing at CA-USA's Nairobi office, will be shifted to the IRS Regional Office when a staff relocation is completed in May.

RTI's Washington, DC, office supports and oversees the project through a senior advisor, technical project managers, program operations specialists, and procurement and financial analyst positions. These staff also liaise with RTI's business units at RTI's Research Triangle Park, NC, headquarters, which include finance and accounting, procurement, contracts, and human resources. In April 2010, as part of the decentralization process, two technical program managers will relocate to Kenya and operate from the RTI Nairobi Regional office.

During this performance period, several new country chief of party (COP) positions were recruited and filled, including Benin, Burkina Faso, Ethiopia, Mozambique, and Rwanda. One COP position for Angola remains open, but we have identified an excellent candidate whom we hope to hire by early May 2010.

A new office space was identified and leased that will be able to accommodate all IRS 2 TO1 staff as well as staff for the Kenya IRS project, managed under a separate USAID task order. The relocation to the new office will take place in May 2010.

There have been several project support accomplishments during this period. First, a Master Tracker was created that enables IRS staff in all locations to access the status of procurements and other key project deliverables. Second, financial reporting tools were improved to enable RTI to report on country and CORE expenditures and pipelines monthly. Finally, we launched a new accounting software program, QuickBooks, in five of the IRS 2 project offices. The roll-out of QuickBooks to all remaining IRS project offices will be completed by September 2010. This will allow COPs real-time access to country and overall project expenditure data to improve both financial project management and work plan budgeting for subsequent years.

Angola

Background

In May 2006, Angola became one of the first three countries to receive funding from the U.S. President's Malaria Initiative (PMI) to support malaria control activities through indoor residual spraying (IRS) in selected provinces with a high burden of malaria. At the time, Angola was recovering from three decades of civil war, which decimated approximately 80% of the country's public health system, leaving only about 30% of the population with access to public health services.

The aim of IRS in Angola is to contribute toward lowering malaria morbidity and mortality by 50% by 2010. RTI International was contracted by the United States Agency for International Development (USAID) as the implementing partner for IRS in Angola and tasked to provide technical, strategic, managerial, and operational support to the Angola National Malaria Control Program (NMCP) to implement IRS. In addition, RTI works with the NMCP to carry out entomological monitoring and training in the provinces where IRS is implemented. The Angola IRS program under PMI/USAID runs from 2005 to 2010. The next scheduled IRS operation is August 30, 2010.

This report summarizes the IRS program's activities in Angola from January 1 to March 31, 2010.

Current Activities and Accomplishments

- PMI/USAID provided clearance for the Angola 2010 work plan on March 30, 2010.
- In order to initiate the procurement process for the 2010 IRS campaign in Angola, RTI issued a Request for Task Order Proposal to Crown Agents-USA (CA-USA) in March 2010. International procurement of personal protective equipment (PPE), insecticide, and spray pumps is now in progress.
- The end-of-spray report detailing the results of the 2009 IRS campaign in Huila and Huambo provinces was submitted to PMI/USAID on March 25, 2010.
- RTI sponsored the participation of two staff members at a national entomology training workshop facilitated by the Integrated Vector Control Management (IVM) project in Bengo from late February to early March 2010.
- RTI officially closed its country office in Luanda and moved the main office to Huambo in January 2010.

Planning and Assessment

No activities took place during the reporting period.

Procurement and Logistics

RTI issued a task order to CA-USA to proceed with procurement of spray pumps, PPE, and insecticide for the upcoming 2010 spray campaign in Huambo, Huila, and Cunene. Purchase orders have been issued for the PPE and spray pumps. A purchase order for the insecticide is

pending completion of the bid evaluation from RTI. RTI anticipates that all internationally procured spray commodities will arrive in Angola no later than July 1, 2010—well in advance of the launch of the spray campaign scheduled for August 30, 2010.

Environmental Compliance

Waste Incineration

Incineration of waste from the 2009 IRS campaign has been delayed because the Ministry of the Environment requested that RTI draft a new letter to formally ask the ministry to provide an official who can monitor the incineration on behalf of the government. RTI anticipates that the waste will be incinerated in early May 2010.

In early March 2010, RTI received certificates for waste incinerated in 2009 from both the Ministry of Environment and the incineration facility. These certificates were shared with the PMI/USAID in-country team in Luanda.

Information, Education, and Communication

No IEC activities took place during the reporting period.

Spray Operations

The final end-of-spray report detailing the results of the 2009 spray campaign was submitted to PMI/USAID on March 25, 2010. The report contained final results on key IRS indicators from the 2009 spray campaign. **Table 1** shows the 2009 IRS campaign summary results.

Table 1. IRS Coverage, Population Protected, and Insecticide Use

Province	Structures		Population Protected			Insecticide Use
	Found	Structures Sprayed (% Coverage)	Children Under 5 Years (% of Total Population)	Pregnant Women (% of Total Population)	Total Population Protected	No. of Sachets (Ratio of Households per Sachet)
Huambo	47,155	45,698 (96.9)	49,026 (22.5)	12,347 (5.7)	217,490	19,420 (1:2.35)
Huíla	60,222	57,033 (94.7)	52,119 (19.4)	15,169 (5.6)	268,484	34,603 (1:1.65)
Total	107,377	102,731 (95.7)	101,145 (20.8)	27,516 (5.7)	485,974	54,023 (1:1.90)

Monitoring and Evaluation

As mentioned above, data on key indicators were finalized for inclusion in the final end-of-spray report.

Project Management and Administration

- The process of recruiting for a new Chief of Party is in progress. In late March, the Regional Finance Manager, Sam Mesfin, visited Angola to provide financial support. He concluded his visit with a debriefing session with the PMI/USAID in-country team at the USAID Mission in Luanda on April 1, 2010.
- The security company in Huambo signed the contract to provide security services in the three Huambo sites beginning March 23, 2010.

- The contracts for the warehouses in Huila and Huambo were renewed. RTI is still searching for a new warehouse to rent in Huambo as the current warehouse is in the city center and does not meet the needs of the IRS program.
- The contract for RTI's office in Luanda ended in February 2010, and the office was officially moved to Huambo during the week of January 18, 2010.

Partnership and Collaboration

RTI will participate in the Malaria Operational Plan (MOP) meetings in Luanda during the first and second weeks of April 2010.

Two participants from RTI Angola attended a national entomology training in Bengo during February and March 2010. The training was facilitated and organized through the USAID Integrated Vector Management (IVM) program. Health technicians from all over the country and officials from the NMCP participated in the training, which provided a solid foundation for further capacity building entomology activities in Angola. The Minister of Health attended the closing ceremonies as a show of the government's support for vector control activities throughout the country.

Outstanding Activities

- Entomological monitoring activities in Huila and Huambo provinces
- Hiring new staff and opening office in Cunene province
- Geographical reconnaissance activities to prepare for the upcoming IRS campaign in Cunene

Upcoming Activities

- Bid evaluation and insecticide selection
- Arrival of PPE, insecticide, and spray pumps in Angola

Benin

Background

With funding from the U.S. Agency for International Development (USAID) and the U.S. President's Malaria Initiative (PMI), RTI International—in collaboration with Crown Agents USA (CA-USA) and the Centre de Recherche Entomologique de Cotonou (CREC, Entomological Research Center of Cotonou)—supports the Benin National Malaria Control Program—the Programme National de Lutte contre le Paludisme (PNLP). RTI provides strategic, technical, management, and operations support for indoor residual spraying (IRS) activities in four epidemic-prone communes of the Ouémé-Plateau (Ouémé for short) Department: Adjohoun, Akpro-Misséréte, Dangbo, and Sèmè-Kpodji.

RTI and PNLP will treat at least 141,154 structures with residual insecticide in the four districts during the third year of IRS. This activity will protect approximately 521,738 persons, which represents at least 85% of the total estimated population in the targeted districts. Two IRS rounds will be conducted: (1) March 10–April 28, 2010, and (2) beginning in August 2010.

In addition, RTI will provide support to PNLP to strengthen local capacity in IRS.

This quarterly report mainly concentrates on preparations for the third IRS year in the four communes. The following activities were planned and carried out: microplanning with staff of the Direction Départementale de la Santé (DDS, Regional Department of Health): recruitment of short-term consultants; recruitment and training of information, education, and communication (IEC) mobilizers and spray operators; training of trainers (TOT) and spray operators; procurement of insecticides and other IRS equipment, and beginning of spray operation in the four communes.

This quarterly report presents the program's progress in Benin from January to March 2010 and summarizes the program's current activities and achievements, outstanding issues, and upcoming activities.

Current Activities and Accomplishments

Planning and Assessment

Logistics Assessments

In early January the RTI operations coordinator and the logistician conducted an inventory of equipment in the main warehouse to identify the quantities of personal protective equipment (PPE) and pesticide needed for this year's IRS round. The RTI team also conducted a field visit in selected villages of the four communes to update information on the routes to be used during operations and determine road access and the average number of households.

Meeting with Community Leaders

In collaboration with PNLP, DDS Ouémé, and the chief doctors of the four communes, RTI staff organized from February 2010 meetings with community leaders in the four pilot

communes to inform them of the IRS schedule and get their support. Participants included chiefs of the targeted villages, traditional leaders, mayors, nurses, and representatives of nongovernmental organizations (NGOs) working in the commune. As an outcome of this meeting, it was agreed to recruit two IEC mobilizers from each village.

Task Force Committee Meeting

The PNLP convened the IRS Task Force committee meeting on February 2, 2010, at the Ministry of Health (MOH). The meeting gathered all stakeholders involved in IRS activities in Benin. In addition to PNLP senior staff, participants included representatives from Ministry of Environment, Ministry of Foreign Affairs, Ministry of Agriculture, Ministry of Local Collectivity, mayors, and chief doctors of the four communes.

The General Secretary of the MOH chaired the meeting. Its purpose was to inform the Task Force committee members about the results of last year’s spraying and the implementation plan of this year’s IRS round. Dr. Imorou Yacoubou, PNLP’s National Coordinator, presented the Benin IRS long-term strategy. At the end of the meeting, the committee recommended that the spraying scheduled this year was to begin no later than March 9, 2010, before the rainy season and the second round in August 2010.

Procurement and Logistics

Procurement

The shipment of 175 barrels of 320 sachets (125 mg) of Bendiocarb was received at the warehouse between March 11, 2010–March, 18, 2010, to complete last year’s stock (2,370 sachets of 12 mg). The total stock includes 58,370 sachets of 125 mg. The stock of insecticides now available is more than seven tons—each round requires 3.5 tons—the amount needed to cover the two IRS rounds planned for this fiscal year (FY) 2010.

Other procurements were also done:

- 24,000 respirator masks
- 4,008 pairs latex nitrile gloves
- 600 coveralls (100 small, 300 medium, 150 large, 50 extra-large)
- 275 pregnancy tests were also delivered to RTI warehouse during the same period.

Table 1 summarizes local procurement that was done by the RTI team:

Table 1: Local Procurement

Items	Quantity	Price (XOF)	Amount
Powdered soap	450	1,300	585,000
Soap for spray pump cleaning	2,400	46	110,400
Soap for operator washing	2,880	84	241,920
Covers	540	600	324,000
Towels	384	500	192,000
	6,554	2,530	1,453,320

Warehouse Space

Since the last round, in order to reduce the spray operators' travel from Adjohoun commune to the main warehouse, a secondary warehouse was set up at Adjohoun. To abide by the rules and regulations of Food and Agriculture Organization of the United Nations (FAO) regarding the storage of hazardous materials, the Adjohoun warehouse was renovated and partitioned, and additional doors and ceiling fans were installed to enhance ventilation. For the round beginning in March 2010, the two warehouses were ready and all the soak pits had been reviewed. All other FAO rules were followed, including:

- Temperature control of the warehouse where insecticides were stored. Throughout the operation, the temperature was recorded daily and did not fluctuate below 25 or above 32 degrees Celsius.
- Fire extinguishers were placed at all strategic locations inside and outside the warehouse, and placement was reviewed.
- The soak pit was reviewed to ensure layers of gravel, broken bricks, charcoal, and sawdust.
- The progressive rinsing area was reviewed.

Transportation

For FY 2010, public advertisement was done to select a company to provide vehicles for spray operator and staff transportation. At the end of the vehicle hiring process, three companies were selected, two for spray operators' transportation and one of IRS staff. Before the operational phase, the RTI driver and mechanic selected appropriate means of transportation for spray operators, supervisors, and RTI staff. Of the 65 vehicles tested, 40 were retained and distributed to the communes. There were two teams of six spray operators per vehicle. During the IRS activities, vehicles were deployed each morning to transport spray operators residing in the communes to the meeting areas where they were provided breakfast.

Environmental Compliance

Pre-IRS Environmental Compliance Inspection

The pre-spray environmental compliance inspection was conducted from February 28–March 13, 2010, by Mr. Autman Tembo, an RTI Senior Environmental Inspector based in the Nairobi Regional Office. During his visit, Mr. Tembo met with stakeholders involved in IRS activities and spent time in the field with the Regional Public Environmental Officer, Dr. Issac Dovoedo, to ensure that all the environmental safeguard processes were followed and the program was in compliance with recommendations prior to spraying. Mr. Tembo also oversaw the update of warehouses.

Information, Education, and Communication

Identification and Recruitment of IEC Mobilizers

Under the supervision of chief doctors and nurses, chiefs of villages were charged to identify IEC mobilizers based on their experience. As agreed during the community meeting, two IEC

mobilizers were recruited per village just after the community meeting. A total of 235 IEC mobilizers (113 women and 122 men) were recruited.

IEC Training of Trainers, February, 12, 2010

Dr. Atayi Simon, Regional Coordinator for PNLP in Ouémé, supported by Mrs. Denakpo Boniface and Serge Attolou (IEC team of PNLP) were the principal trainers. A total of 45 Chiefs of Health Post in charge for IEC mobilizers training took part in this important training session. The launching ceremony of this session was headed by Dr. Hubert Dedjan, DDS-Ouémé (Regional Health Director).

IEC Mobilizer Training

After the IEC TOT, IEC mobilizer training was done from February 16–19, 2010, in seven sessions (two each in Sèmè-Kpodji, Akpro-Missérété, and Adjohoun, and one in Dangbo). In total, **235 IEC mobilizers were trained (113 females and 122 males).**

IEC Campaign Implementation

- IEC activities were launched in each commune and the advocacy for chiefs of villages and other stakeholders was done in Sèmè-Kpodji, Adjohoun, Dangbo, and Akpro-Missérété. In Adjohoun, the advocacy was led by the King of the Region. Most of the religious leaders (Muslim, Catholic, traditional, and others) attended this important mobilization meeting.
- To improve IEC data collection, on March 4, 2010, a meeting was held at the regional health conference room with 21 Chiefs of Health Post to familiarize them with the IEC data collection form proposed by the PNLP IEC team.
- IEC mobilizers went door to door to visit each household, distribute leaflets, and inform households about the benefit of IRS and the precautions that should be taken before, during, and after spraying.
- As part of the sensitization effort, well-known musicians sang in local languages about the benefits of IRS. Village, traditional, and religious leaders spoke about IRS. Public reminders were used by the village announcer, who traveled around the villages prior to the start of spraying to deliver information about the spray schedule. Megaphones were used in the four communes before the beginning of spray operations.
- Four community radio stations broadcasted IRS information seven times per day. The contract included radio spots, shows, and skits that were all broadcasted at prime times during the day throughout spray operations. During this time, the IRS schedule was also announced for each village.
- The PNLP IEC team is very engaged in the implementation and supervision of IEC activities.

Reproduction of IEC Materials

IEC materials used last year were updated based on lessons learned from the previous IRS round. These materials were reproduced and distributed to IEC mobilizers after the training session.

Spraying Operations

Geographic Reconnaissance

The RTI operations coordinator and the logistician visited the four communes to carry out geographical reconnaissance from January 18–22, 2010, to update the technical, logistics, human resources, and other operational needs required to implement IRS activities for this year's round of spraying. The team visited selected villages in the four communes to update distances between villages, road access, average number of households, routes to be used during operations, and commodities to be procured locally.

Microplanning

The planning meeting for the next round of IRS was held on February 4, 2010, with DDS Ouémé at Porto Novo. This meeting gathered about 40 persons from the national level and Ouémé Department. Participants included the PNLN coordinator, the PMI focal point person from the MOH, the representative of National Hygiene Department from Cotonou, a representative from the Ministry of Environment, the Director of Ouémé Health Department, medical chiefs, and mayors of the four communes. The meeting ended late in the afternoon with the adoption of the next round of IRS microplanning in plenary session by all participants. The spraying was scheduled to start March 9, 2010 in all four communes after the technical launching ceremony on March, 8, 2010.

Recruitment and Training of Spray Teams

The purpose of the training was to build the capacity of partners from the national level in order to have a well-organized IRS program. A series of trainings, as described below, was conducted before the beginning of IRS operations in the field.

- **Training of trainers**

A five-day TOT was held from February 22–26, 2010, in Porto Novo, in the DDS conference room. The TOT was conducted by Dr. Vincent Sodjinou, Deputy Director of Regional Health; Dr. Victor Nounangnon, Monitoring and Evaluation (M&E) Officer of the Regional Health Office; Mr. Sourou Adjinda, Jr., and the Chief of Regional Hygiene and Sanitation Services, Dr. Issac Dovodeo of the Regional Environmental Office; and the PNLN representatives led by Dr. Simon Atayi, the Regional PNLN Coordinator. This pool of trainers was supported by the RTI technical team including Dr. Sy Ngayo, Consultant, and Eugene Kiti, IRS Operations Manager. In total, 33 public hygiene and sanitation agents (15 females and 18 males) and nine others (five logistics assistants, three spray pump maintenance personnel, and one warehouse manger) were trained as spray operator trainers. In addition, four chief doctors from the communes, the malaria coordinator from Ouémé Department, and five senior staff from PNLN and DDS were also among the trainees. The launching and closing ceremony of this training session was headed by Dr. Hubert Dedjan, the Regional Health Director.

- **Medical test of spray operators**

To assess whether spray operators were physically fit and able to conduct IRS activities, a physical checkup was performed by the chief doctors of each commune before spray operators were selected. Only those spray operators given a medical certificate attesting to

their health and ability to perform IRS operations were accepted as spray operators. All female spray operators and washers were also tested for human chorionic gonadotropin levels to determine if they were pregnant.

- **Training of spray operators**

Spray operator training was conducted from March 2–5, 2010. In total, 330 potential spray operators (316 males and 14 females) were trained in nine concomitant four-day sessions that were organized at the commune level by 30 trainers. Representatives from PNL, hygiene service, Ministry of Environment, Ministry of Agriculture, and DDS supervised all training sessions. The spray operator training breakdown by commune is listed below:

Sèmè-Kpodji, 118 (108 males and 10 females), 3 sessions

Akpro-Missérété, 75 (73 males and 2 females), 2 sessions

Adjohoun: 72 males, 2 sessions

Dangbo, 65 (63 males and 2 females), 2 sessions

Only 265 operators who passed the written and practical tests were then sent for a thorough physical checkup before they could be recruited.

- **Training of drivers**

Thirty-nine drivers attended to a one-day training session on how to transport spray operators and how to use PPE and fire extinguishers. The training was held at the Porto Novo warehouse on March 6, 2010.

- **Security training at the warehouse**

On March 6, 2010, the fire station manager from Porto Novo provided a day-long training for 10 persons working at the warehouse on how to use fire extinguishers.

- **Training of washers**

On March 6, 2010, 26 washers received a one-day training session on how to use PPE like gloves when cleaning to avoid contamination. The training was held at the Porto Novo warehouse and conducted by RTI staff and a representative of the Ministry of Environment.



IRS Launching Ceremony

On March 8, 2010, the IRS operations were officially launched by the head of Ouémé Health Department, Dr. Dedjan Hubert, at Porto Novo warehouse. The ceremony was attended by health and community officials at the national and regional levels.

Other Activities

Entomological Monitoring

Entomological evaluation of IRS is being conducted by a CREC team in the four communes since of the current spray operation began on March 10, 2009. This evaluation will continue until the spray operation ends. CREC's contract renewal is not yet complete, and we are

currently working to translate the statement of work (SOW) from French to English and looking forward to the contract finalization.

Capacity Building of Ministry of Health

Three senior staff from the PNLP and health personnel from DDS and districts were trained in IRS and were also involved in IRS quality control. These staff were tasked with monitoring the quality of the IEC campaigns, the quality of the spraying performed by the operators, and the proper use of protective gear. They provided on-the-spot corrections and/or dismissal of personnel when necessary. For this IRS round, all IEC activities are handled by the PNLP team at the national, regional, and local levels.

Monitoring and Evaluation

Trainers and spray operators were trained on how to fill out the daily forms. Group heads, team leaders, and spray operators fill out data collection forms on a daily basis during spray operations. To ensure the quality of data collection, three levels of supervision were put in place: 1) team leaders check the spray operators' forms; 2) group heads check team leaders' forms; and 3) district coordinators check and review all forms. District coordinators summarize the data for daily reporting, and the data were sent to clerks for processing. Four data clerks (one per district) were recruited and trained by the M&E consultant and Dr. Victor Nounangnon, M&E Officer at the DDS before the operations. After data are entered by the clerks on a daily basis, an M&E spreadsheet detailing the data collected on the standard PMI indicators is completed by the M&E consultant.

The regional Environmental Officer was in charge of the environmental monitoring by tracking the following three components to ensure compliance with regulation: human health, transportation, and management of waste.

Preliminary results of structures sprayed and coverage during the first two weeks are summarized in *Table 2*.

Table 2. Coverage and Protection—Preliminary Results

District	Coverage Structures		Protection Population Protected			Use				
	Found	Treated	Total	Children Under 5 Years	Pregnant Women	Found	Pregnant Women Sleeping Under Net	Children Under 5 Years Sleeping Under Net	Insecticide Empty Sachets Returned	Mean Sachets Per Structure Sprayed
Adjohoun	2,697	2,697	16,510	2,244	1,234	4,459	1,177	1,877	967	2.79
Akpro-Missérété	2,215	2,188	15,059	2,270	1,245	4,609	1,161	2,006	814	2.69
Dangbo	2,051	1,964	11,600	1,628	918	3,321	858	1,485	603	3.26
Sèmè-Kpodji	5,123	5,121	31,439	3,820	2,106	9,630	2,091	3,775	1,370	3.74
TOTAL Week 2	12,086	11,970	74,608	9,962	5,503	22,019	5,287	9,143	3,754	3.19

Table 3 summarizes training activities.

Table 3. People Trained to Deliver IRS

	IEC Trainers	IEC Mobilizers	Spray Trainers	Spray Operators	District Admin. Teams (<i>Finance Logistics, District Coordinators, M&E, etc.</i>)	Washers, Drivers, etc.
Adjohoum	8	67	7	72	4	17
Sèmè-Kpodji	5	65	9	118	4	21
Dangbo	4	37	7	65	4	11
Akpro-Misséréte	4	66	7	75	4	16
DDS Ouémé	1	-	7	-	-	-
National level	1	-	6	-	-	-
TOTAL	23	235	43	330	16	65

Project Management and Administration

Recruitment

To reinforce the RTI Benin team, two short-term consultants were recruited to work on IEC and M&E activities. All of the consultants were on board as of March 2010 before the beginning of the spray operation.

Partnership and Collaboration

During this reporting period, the RTI Benin team attended a number of meetings and workshops with country malaria partners, as summarized below.

PMI Coordination meeting

The RTI Benin team attended the PMI review meeting at the USAID conference room on February 19, 2010. All the PMI implementing partners working in Benin, including Management Sciences for Health (MSH), Integrated Family Health Project/University Research Co., LLC (URC), Improving Malaria Diagnostics (IMaD), CREC, and PSI, attended this meeting. The purpose of the meeting was to exchange information among in-country PMI implementing partners, identify challenges that occurred during last quarter, and discuss solutions. The meeting was chaired by the new USAID family and health team leader, Dr. Milton Amayun. The RTI team was invited to present accomplishments made on the IRS project during last quarter. The details of the implementation plan of the next IRS round were also shared with the participants. At the end of the meeting the USAID health team leader encouraged RTI to start spraying on March 9, 2010.

Malaria Partners' Meeting

RTI participated in the malaria monthly partners' meeting on March 4, 2010. The meeting took place at the PNLP conference room in Cotonou. Participants included representatives from World Health Organization (WHO), UNICEF, USAID, Centers for Disease Control and Prevention (CDC) Atlanta, World Bank, RTI, PSI, Catholic Relief Services (CRS), and senior staff from the PNLP. The meeting was chaired by the coordinator of the NMCP. The partners made brief presentations on their activities. The RTI team shared with the participants the results of last IRS round and the third IRS round schedule.

All USAID/PMI subcontractors met with USAID/Benin meeting at a Performance Expectation meeting, held March 19, 2010, with the USAID team. The purpose was to share with all subcontractors of USAID/PMI the new vision, mission and value of the USAID/Benin mission and the exchange of performance expectations. In the meeting, temporary duties (TDYs) and the next site visit of the U.S. Ambassador and Benin MOH were discussed.

Outstanding Activities

- Work closely with PNL and the USAID/Benin mission PMI team to make preparations for the U.S. Ambassador and MOH to visit the field (scheduled for April 15, 2010).
- Finalize the CREC contract for entomological assessment and evaluation, and sign the memorandum with the MOH.

Upcoming Activities

- Complete current spray operation in the four communes
- Continue preparations for second spray round, August–October 2010
- Entomological evaluation of IRS in the four communes
- IRS end-of-spray report
- End-of-spray workshop

Burkina Faso

Background

In July 2005, the United States Government announced a five-year, \$1.2 billion malaria initiative to rapidly scale up malaria prevention and treatment interventions in 15 high-burden countries in sub-Saharan Africa. The United States President's Malaria Initiative (PMI) began with \$30 million in bilateral funding in fiscal year (FY) 2006, which increased to \$135 million in fiscal year 2007 and to \$300 million in FYs 2008 and 2009, and is expected to reach \$500 million in FY 2010.

PMI has set four objectives, with a final goal of reducing malaria-related mortality by 50%. One of the objectives is 85% coverage of indoor residual spraying (IRS) in target communities. Now in its fourth year of funding, PMI is fully implementing IRS activities in 15 countries. In partnership with National Malaria Control Program (NMCP) and in support of country-level strategic plans, PMI is providing technical, managerial, and commodity support for IRS campaigns in all 15 PMI countries.

In September 2009, RTI International was awarded the Indoor Residual Spraying 2 (IRS 2) Task Order One for the continued implementation of IRS in Sub-Saharan Africa. The purpose of this task order is to support PMI and United States Agency for International Development (USAID) missions or bureaus outside PMI countries to plan and implement IRS programs with the overall goal of reducing the burden of malaria in Africa. Task Order One enhances PMI/USAID's ability to implement IRS programs on the ground through cost-effective procurement and logistics, access to technical expertise, and implementation of IRS in countries affected by malaria.

In October 2009, RTI met with stakeholders to discuss plans for implementation of IRS in Burkina Faso. The stakeholders determined, given that FY 2010 would be the first year for USAID-supported IRS in Burkina Faso, that a pilot IRS program in the district of Diébougou covering about 25,000 households would be most appropriate.

In December 2009, a team of RTI IRS experts traveled to Burkina Faso and worked with the NMCP and the regional and district health teams in Diébougou to plan for the upcoming spray round, scheduled to begin May 12, 2010. The team accomplished the following activities: selection of IRS implementation sites, selection of insecticide, collection of baseline data, geographical reconnaissance and logistics assessment, development of a national Environmental Impact Assessment (EIA) Report to satisfy host government environmental regulations, and a Supplemental Environmental Assessment (SEA) to comply with USAID Code of Federal Regulations (CFR) 216. Also, a suitable solid waste disposal facility was identified for IRS solid wastes that will be generated during the operations.

Current Activities and Accomplishments

Activities completed during the quarter from January 1–March 31, 2010, include preliminary visits for IRS preparation in Burkina Faso as well as IRS start-up activities.

Planning and Assessment

During January and February, the acting Chief of Party (COP), Dr. Adama Kone, together with the regional and home office teams, continued finalizing the 2010 Burkina Faso work plan and budget. USAID had some questions on the budget submitted by RTI, and after dialogue, USAID approved a 50% level of effort (LOE) for the COP in Burkina Faso, with the remaining 50% allocated as technical assistance to PMI-supported IRS programs in other countries.

In February, the COP visited the selected district of Diébougou and worked with the district health team to develop a detailed implementation plan and the budget for local activities. In March the detailed plan and local budget were reviewed by the regional health director and NMCP coordinator. The launch of the IRS campaign is planned for the second week of May 2010.

Geographical reconnaissance in early 2010 showed that the actual number of structures to be sprayed in the target district is 23,927, corresponding to a population of 107,456 people.

Procurement and Logistics

In January and February, the RTI Burkina Faso team developed a list of personal protective equipment (PPE) and other materials that required international procurement. The commodities were ordered and arrived in time for the IRS launch. The COP and the finance manager completed the local procurement list in preparation for the open tender announcement in early April. **Table 1** shows commodity requirements for the May 2010 IRS campaign in Burkina Faso.

Table 1. Procurement Needs for Pesticides, PPE, and Other IRS Materials

Item	Quantity
Debit regulator ref. no. 64 catalog no. 148.000X	130
Gloves - latex nitrile	600
Pregnancy test kits (with French/English labels)	45
Respirator masks	13,500
Helmets	200
Coveralls	400
Rubber boots	200
Barrels (for progressive rinsing)	70
Spray pumps, 10 liters—effective volume or 4 gallons, satisfying World Health Organization (WHO) standard	140
Bags	200
Pump maintenance kits	50
First aid kits (each kit to serve 10 people with French/English labels)	300
FICAM VC WP 80	17,280 sachets

Based on entomological data and other important local factors, the carbamate class of insecticide was selected for IRS in Burkina Faso; 17,280 sachets of FICAM VC WP 80 (bendiocarb) were procured for the first round of IRS. The insecticide arrived on April 1, 2010, in Ouagadougou and was then transported over land to Diébougou. The High Commissioner at Diébougou provided RTI with a large warehouse to store insecticide, PPE and other IRS equipment. RTI will provide electricity in the facility.

In February, the Ministry of Health requested a letter from the Ministry of Environment to temporarily authorize the importation of carbamates and organophosphates. The authorization was granted in mid-March; however, the letter specified that the imported pesticides must be on the list of registered pesticides provided by CILSS (*Comité Inter-Etat de Lutte Contre la Secheresse dans le Sahel*, Interstate Committee for Drought Control in the Sahel), a regional body with headquarters in Bamako, Mali. Ficam[®], the insecticide approved and procured for IRS in Burkina Faso, is not on that list. Bayer's request of homologation that was submitted has not yet been granted. The government has accepted entrance of the insecticides in the country on a temporary basis.

Environmental Compliance

The SEA was prepared in close collaboration with officials at government ministries (e.g., health, agriculture, and environment) during a visit to Burkina Faso in December 2009 by a regional team of RTI experts. It was submitted to USAID in early January 2010 and approved in February 2010.

In late March, the Regional Environment Inspector supported the Burkina Faso RTI team to identify washing areas, soak pits, and insecticide stores locations at seven sites in the Diébougou. The team worked with the District Health Management Team (DHMT) to construct the soak pits at a reasonable cost. The effort was supervised by DHMT. The team also identified potential storage facilities at each site and assessed the repair and rehabilitation needs at each facility. The government of Burkina Faso provided the insecticides stores, and RTI will do necessary repairs to enhance security of the stores.

IRS Waste Disposal

In December, the RTI regional team visited the Central University Hospital in Ouagadougou to determine whether the incineration facility meets the standards for pesticide waste disposal set forth by the Food and Agriculture Organization of the United Nations (FAO) and WHO. The Central University Hospital's incinerator satisfies the requirements for incineration of IRS waste. RTI plans to transport IRS wastes to this facility for disposal following completion of IRS operations. The team also met with the Directorate of Hygiene and Health Education in charge of incinerators at the national level. The Directorate has already purchased 60 incinerators for installation at provincial level hospitals nationwide. Bougouriba province, where the IRS operations are targeted, is one of the provinces that will receive an incineration facility. When this occurs, the IRS project will have an alternative waste disposal facility in closer proximity to the target IRS districts, thereby reducing transport costs.

Information, Education, and Communication (IEC)

The COP shared available documents in French on IRS, including training documents and draft tools on IEC, with the IEC unit at the NMCP. IEC activities include identifying all

relevant stakeholders at national, regional, and district levels; adapting and developing IEC materials and pilot testing them; and training of trainers (TOT) and IEC implementers. IEC activities will be coordinated by the IEC coordinator at district level with support from NMCP IEC team at the national and regional levels, and with assistance from RTI's regional IEC specialist in Nairobi, who will visit Burkina Faso in April 2010.

The NMCP coordinator assured that the NMCP IEC team was ready to collaborate with RTI. In mid-March, RTI began working with NMCP/IEC team to prepare for the IEC tools adaptation workshop. Tailoring and modification of the tools and materials will be based on the existing IEC materials available at the NMCP as well as existing tools that have been used in other IRS countries. The workshop will take place in the second week of April. Participants will come from the Directorate of Hygiene and Health Education (DHPEPS), the NMCP, the Ministry of Environment and Livelihood, and the regional and the district health teams. The RTI IRS regional IEC specialist will support RTI and the NMCP to conduct the workshop.

Spray Operations

During the reporting period, RTI informed the national, regional, and district level health authorities of the types of seasonal personnel required for spraying activities. They agreed that the position for the seasonal IRS district coordinator would be filled by a member of the DHMT. The COP emphasized that the IRS district coordinator should be fully available during IRS operations. In addition to providing an individual at district level to coordinate spray operations, the district authorities also agreed that the district health systems information officer should fill the role of the IRS data clerk during the spray campaign. The launch of spray operations is planned for May 12, 2010.

There are 14 *Centres de Santé et Prévention Sociale* (CSPS, Health Centers) in the district, which are grouped into seven spray sites. The head nurse of each CSPS will be trained on IRS, and these nurses will supervise spraying and IEC activities.

The COP described the criteria for the selection of spray operators, team leaders, washers, and drivers during meetings at district, regional, and national levels. However, to promote ownership and sustainability, local health and administrative authorities will recruit these staff. The district health team has started working with local leaders on the selection of both spray operators and IEC mobilizers. **Table 2** below shows the numbers of personnel to be trained at each spray site in Diébougou district.

Table 2. Total Seasonal Spray Personnel

Name of Site District of Diébougou	Estimated No. of Structures	No. of Spray Operators (30 days)	Team Leaders	Super- visors	IEC Mobilizers	Washers	Store Keepers	Security Guards	Total Spray Personnel
Diebougou	6,699	37	6	2	27	4	1	1	78
Loto	3,245	18	3	1	17	2	1	1	43
Dolo	2,176	12	2	1	14	2	1	1	33
Bondigui	3,317	18	3	1	15	2	1	1	41
Iolonioro	2,379	12	2	1	33	2	1	1	52
Tiankoura	4,185	23	4	1	45	2	1	1	77
Diassara	1,926	11	2	1	18	2	1	1	36
Total	23,927	131	22	8	169	16	7	7	360

Other Activities

- Peter Hubbard, Director of the USAID Office of West African Affairs, visited Burkina Faso and met with PMI partners. USAID is in the process of opening a Mission in Burkina Faso. Mr. Hubbard was briefed about the USAID-supported activities already taking place in the country, including the malaria activities supported by RTI, the USAID Maternal and Child Health Integrated Program (MCHIP), and USAID | DELIVER.
- In March, the Finance Manager was trained on QuickBooks by RTI staff from the home office and by regional finance teams.
- In late March, the Regional Environmental Inspector arrived in Burkina Faso to complete the IRS pre-inspection. He visited Diébougou and worked with the DHMT to identify storage facilities and sites for soak pits, and initiated the construction of soak pits.

Human Resources

Staffing:

1. The **Finance Manager** was recruited and started working as full-time staff on March 15, 2010.
2. None of the originally interviewed candidates for the **Logistics Manager** position was available to start work immediately—all would be available six weeks after notification of their selection. Thus, a new candidate was interviewed and was offered the job, and is scheduled to start work on April 9, 2010.
3. The **Technical Manager** has been recruited and will start work with RTI on April 9, 2010.

RTI subleased one room at the Jhpiego office beginning March 10, 2010. An agreement has been signed between RTI and Jhpiego for a sublease of two months. However, during the last week of March, RTI identified an office space one floor below the Jhpiego office. The office will be available in the second week of April.

Information Technology

The Finance Manager was provided with a laptop, high-speed scanner, and accessories. This will allow him to send his reports on time and efficiently. Assistance is being provided via remote desktop for information technology (IT) issues. Procurement for additional IT equipment is underway.

Monitoring and Evaluation

The technical coordinator will be in charge of monitoring and evaluation (M&E). The regional office shared with the in-country program the training manual and all the IRS tools for capturing and reporting data, including the IRS database. RTI will provide continuous support to assist the program in the adoption and implementation of the M&E system. No activity was conducted during this quarter.

Upcoming Activities (April 1–June 30, 2010)

- The Regional Environment Inspector will continue undertaking the pre-spray environmental compliance inspection during the first half of April 2010. He will continue to monitor the construction of the soak pits and warehouse repairs during this period.
- Mid-spray environmental compliance inspection is expected to be conducted toward the end of May by the Regional Environmental Specialist.
- Develop, translate, and pilot test IEC materials.
- Provide TOT and training of seasonal personnel on IRS, IEC, and M&E.
- Recruit and train IRS operators.
- Implement IRS activities.
- Provide continuous review of data collection, maintenance, and processing.

Ethiopia

Background

Ethiopia is one of the third group of countries to receive Indoor Residual Spraying (IRS) funding under the United States President's Malaria Initiative (PMI) since fiscal year (FY) 2008. PMI resources are primarily targeted at Oromia Regional State in 30 districts in five zones: 11 in East Shoa, 5 in Arsi, 4 in West Arsi, 4 in West Hararge, and 6 in Jima). The IRS project in Ethiopia is led by RTI International with funding from the United States Agency for International Development (USAID), under contract GHN-I-01-06-00002-00 from 2006 to 2011, in collaboration with Crown Agents USA (CA-USA), Oromia Regional Health Bureau (ORHB), the Ethiopian Health and Nutrition Research Institute, Addis Ababa University's Institute of Pathobiology, Academy for Education and Development (AED), the Health Education and Extension Center, the Ministry of Agriculture National Environmental Protection Authority, World Health Organization (WHO), the United Nations Children's Fund, and other implementing partners.

Major activities include the procurement of sprayers, protective equipment, and supplies; rehabilitation of storage facilities; mapping of areas to be sprayed; training of local staff in IRS operations; and management of spray operations, in addition to pre- and post-campaign surveys to assess the effectiveness of information, education, and communication (IEC) activities and the population's satisfaction with IRS operations. The project also supports entomological monitoring and susceptibility studies.

IRS operations took place between May 29–July 17, 2009. Post-IRS evaluation and third-round IRS microplanning meetings were conducted and involved all 30 IRS target districts and major partners.

This report presents the program's progress in Ethiopia from January 1–March 31, 2010, and summarizes the program's current activities and achievements, outstanding issues, and upcoming activities.

Current Activities and Accomplishments

During this reporting period, RTI Ethiopia completed rehabilitation of 23 district storage facilities; an assessment report of a house replastering survey in 11 districts; determination of the seasonality of transmission and whether larval breeding continues throughout the year in two districts; and modification of seven of 38 evaporation tanks to soak pits.

Planning and Assessment

PMI/USAID supported third-round IRS microplanning, which was held on December 7, 2009, at Gete Hotel, Adama. During this microplanning exercise, seven new districts joined the RTI project, including one district from West Arsi zone and six districts from Jima zone, for a total of 30 districts. Each of these districts prepared a draft IRS plan with guidance and technical support from RTI, ORHB, zonal malaria focal persons, and PMI/USAID. Each district performed logistics assessments to determine requirements, availability of resources, and to identify gaps. Anticipated challenges were identified to seek solutions ahead of time

during the planning exercise. The draft work plan was presented to the plenary and discussed. Consensus was reached on the number of unit structures to be sprayed, human resources needed, and vehicles and personal protective equipment (PPE) required for the operation. Based on this microplanning exercise, a draft FY 2010 Malaria Operational Plan (MOP) and budget were prepared for upcoming IRS operation.

Procurement and Logistics

During this reporting period, a shortage of storage was resolved in Fentale, Anchar, Adea, and Akaki districts. In each of them, warehouses were completely rehabilitated for suitable storage of insecticide and IRS materials.

Environmental Compliance

An RTI Environmental Compliance and Quality Assurance Officer has inspected and assessed the condition and the status of evaporation tanks and storage facilities with respective district malaria focal persons. The field assessment result indicated that only nine evaporation tanks were completely dried, and the residues of dichloro-diphenyl-trichloroethane (DDT) were collected and transported to central storage. Seven of these dried evaporation tanks were modified to soak pits. This modification of evaporation tanks in previous project districts and construction of soak pits in newly added districts will be continued and completed before the start of 2010 IRS operations.

Information, Education, and Communication

Assessment of a house replaster rate survey was conducted in 1,050 households in 11 districts to evaluate the effectiveness of IEC and to identify message gaps to be improved for third-round IRS. The findings of this assessment indicated that effective communication strategies should be addressed to utilize the health extension workers and IEC mobilizers in combination with other channels. The survey report was completed and submitted to all stakeholders.

Spray Operations

A third-round IRS microplanning meeting was held on December 7, 2009, with 30 district health office heads and malaria focal persons with the guidance and technical support of RTI, zonal, and ORHB malaria focal persons, and PMI/USAID. The final consensus reached on the number of unit structures and population to be protected by IRS is presented in ***Table 1*** below.

Table 1. Number of Unit Structures and Population to Be Protected by IRS

Zone	Districts	Unit Structures	Total Population in Targeted Communities
East Shoa	Adama	30,060	75,679
	Adea	22,149	56,388
	Adami Tulu	32,269	115,488
	Akaki	14,189	43,995
	Boset	23,475	62,600
	Bora	16,238	50,522
	Dugda	19,815	65,779
	Fentale	19,635	48,572
	Gimbichu	2,420	5,769
	Lume	16,919	37,990
	Liben Zikuala	22,034	67,469
	Total	219,203	630,251
Arsi	Dodota	19,693	47,536
	Jeju	12,914	40,196
	Merti	17,008	54,754
	Sire	9,318	24,560
	Zuway Dugda	23,611	83,386
	Total	82,544	250,432
West Arsi	Arsi Negele	35,552	116,947
	Shashemene	28,076	140,752
	Shalla	24,695	98,396
	Siraro	34,124	154,931
	Wondo	14,800	39,548
	Total	137,247	550,574
West Hararge	Miesso	26,443	115,775
	Chiro	27,334	116,836
	Anchar	12,823	53,277
	Total	66,600	285,888
Jima	Kersa	20,588	88,735
	Omo Nada	28,153	77,524
	Seka Chokorsa	18,558	43,329
	Shebe Sombo	10,774	46,989
	Sokoru	12,975	33,447
	Tiro Afata	19,545	46,756
	Total	110,593	336,780
Grand Total	616,187	2,053,925	

Other Activities

Entomological Monitoring

Starting from November 2009 until March 2010, two major entomological studies were completed: (1) determination of the seasonality of transmission and whether larval breeding continues throughout the year in two districts using larval, pyrethrum spray catches, and human landing collections at two villages; and (2) residual life of deltamethrine on mud walls in five houses in Adama district.

Anophelines were found during all months of the study period. Monthly summaries of anopheline at the two sites (**Table 2**) clearly show the seasonal nature of the potential vector abundance. High densities of anophelines occurred at Kolonel Camp in March 2010, following the small rains. Of the total 244 *Anopheles* mosquitoes collected at this site, 219 (89.8%) were collected during this month. In contrast, the highest density at Eddo Kontolla was recorded in December 2009. The frequency of mosquitoes in both human landing and pyrethrum space spray collections was very low at both sites during the dry months of January and February. These are presumed to be a result of the high temperature and drying of potential breeding sites. The low numbers of mosquitoes at Kolonel Camp in the other months may also be due to IRS with deltamethrin in October (performed by ORHB), and the low number at Eddo Kontolla in March could be due to the low temperature and/or wind observed at this site. Overall, three species of anopheline mosquitoes were collected, comprising *Anopheles gambiae*, *An. pharoensis*, and *An. coustani*. *An. gambiae*, the major vector of malaria in the country accounted for 36.9% (225/609) of all the anophelines collected. The peak *An. gambiae* density recorded during the month of March may play a significant role in the transmission of malaria and calls for effective control measures. Human landing collections conducted indoors and outdoors indicated *An. gambiae* may bite more outdoors (59.4% versus 40.6%) at Kolonel Camp). However, due to the low number caught at Eddo Kontolla, no such conclusion could be reached for this site. *An. pharoensis* also exhibited more exophagic behavior, with 60.9% at Kolonel Camp and 75.5% at Eddo Kontolla being caught attempting to bite outdoors. *An. coustani* at Eddo Kontolla similarly exhibited more exophagic behavior (80.8% versus 19.2%). The exophagic behavior of the mosquitoes indicates that most *Anopheles* mosquitoes find humans outdoors and therefore control measures in addition to IRS need to be implemented.

The peak biting activity of *An. gambiae* at Kolonel Camp was in the middle of the night (22:00–02:00), and at Eddo Kontolla the *An. pharoensis* biting peak was after people had retired to bed. In contrast, peak indoor biting activity for both *An. pharoensis* and *An. coustani* at Eddo Kontolla was early in the evening (18:00–22:00).

Table 2. Human-biting and Pyrethrum Spray-collected *Anopheles* Species Collected at Kolonel Camp and Eddo Kontolla (November 2009–March 2010)

Month/Year	Kolonel Camp					Eddo Kontolla					
	Human Landing		Space Spray		Total	Human Landing			Space Spray		Total
	A.g	A.ph	A.g	A.ph		A.g	A.ph	A.c	A.g	A.ph	
November 2009	8	1	--	--	9	3	128	15	--	3	149
December 2009	7	2	--	--	9	1	94	82	1	3	181
January 2010	1	3	--	--	4	--	27	1	--	1	29
February 2010	3	--	--	--	3	--	2	1	--	--	3
March 2010	188	18	12	1	219	1	2	--	--	--	3
Total	207	24	12	1	244	5	253	99	1	7	365

-- None caught

A.g – *Anopheles gambiae*; A.ph – *An. pharoensis*; A.c – *An. coustani*

The wall bioassay was conducted after one month of application of insecticides (**Table 3**). Laboratory-reared *An. arabiensis* mosquitoes—sugar fed for 2–3 days, were used for the test. After the WHO plastic cones were fastened to a selected spot on the sprayed surface to be tested at high (1.5 meters), medium (1 meter), and low (0.5 meters) surface, 10 mosquitoes were introduced into the bioassay cones and left undisturbed for 30 minutes of exposure time. In each house, 10 mosquitoes exposed to an untreated surface served as the control. At the end of the 30-minute exposure time, the mosquitoes were removed and transferred to a recovery chamber (paper cups) with access to a sugar solution, and mortality was recorded after 24 hours of holding time. When the control mortality was between 5–20%, the average observed mortality was corrected by Abbott's formula.

Table 3. Results of Wall Bioassay, Eddo Kontolla, Kolonel Camp, Ethiopia, December 2009–March 2010

Month/Year	Chemical Type	No. Houses	<i>An. arabiensis</i>			
			Total Exposed	Mortality N (%)	Control	Mortality N (%)
December 2009	K-Othrine WG 250%	1	30	25 (81.5)	10	1 (10)
	Deltamethrin 2.5% water dispersible powder [WDP]	1	30	28 (92.6)	10	1 (10)
January 2010	K-Othrine WG 250%	3	90	86 (95.3)	30	1 (3)
	Deltamethrin 2.5% WDP	2	60	59 (98.3)	20	1 (5)
February 2010	K-Othrine WG 250%	3	90	85 (94.4)	30	0 (0)
	Deltamethrin 2.5% WDP	2	60	58 (96.6)	20	1 (5)
March 2010	K-Othrine WG 250%	3	90	84 (92.2)	30	3 (10)
	Deltamethrin 2.5% WDP	2	60	53 (87.0)	20	2 (10)

The results in **Table 3** demonstrate that K-Othrine and deltamethrin were effective for at least four months. Four-month old deposits showed a mosquito mortality rate of 92.2% and 87%

for K-Othrine and deltamethrin respectively. The finding suggests these two insecticides are options for DDT replacements in areas of high resistance.

Capacity Building of Ministry of Health

Entomological surveillance and vector density monitoring have been conducted each month this quarter in collaboration with Federal Ministry of Health (FMOH) staff from different districts as a means of capacity building and skills transfer. The RTI team also participated in training of malaria prevention and control in general, and IRS and entomological monitoring surveillance that were organized by FMOH.

Monitoring and Evaluation

Second-round IRS operation was done from May 29–July 17, 2009, in all 23 districts. **Table 4** presents the plan for and performance of these activities.

Table 4. Structures Sprayed and Coverage

Zone	District	Structures	Structures Sprayed	% Coverage	Population Protected
East Shoa	Adama	30,060	28,061	93.3	71,335
	Adea	22,149	20,685	93.4	53,619
	Adami Tulu	32,269	29,822	92.4	107,576
	Akaki	14,189	13,752	96.9	42,712
	Boset	23,475	21,365	91.0	57,913
	Bora	14,417	12,797	88.8	41,928
	Dugda	19,815	17,654	89.1	60,133
	Fentale	19,635	15,017	76.5	39,942
	Gimbichu	2,420	2,410	99.6	5,767
	Lume	16,919	10,995	65.0	25,783
	Liben Chukala	22,034	20,251	91.9	62,711
Zone Total	217,382	192,809	88.7	569,419	
Arsi	Dodota	19,693	18,727	95.1	45,910
	Jeju	12,914	12,566	97.3	39,736
	Merti	17,008	15,564	91.5	50,181
	Sire	9,318	8,825	94.7	23,751
	Zuway Dugda	25,432	23,891	93.9	85,302
	Zone Total	84,365	79,573	94.3	244,880
West Arsi	Siraro	28,984	26,188	90.4	110,614
	Shala	24,695	22,583	91.4	91,851
	Shashemene	42,857	41,306	96.4	137,030
	Arsi Negele	35,552	34,406	96.8	115,068
	Zone Total	132,088	124,483	94.2	454,563
West Hararge	Miesso	26,443	24,282	91.8	107,184
	Chiro	27,334	25,745	94.2	111,594
	Anchar	12,823	12,510	97.6	51,523
	Zone Total	66,600	62,537	93.9	270,301
GrandTotal		500,435	459,402	91.8	1,539,163

Table 5 describes training during the reporting period.

Table 5. People Trained to Deliver IRS, including Related IEC

Zone	No. of Districts	IEC Trainers	IEC Mobilizers	IRS Trainers (Squads, Team Leaders, Supervisors)	Spray Operators and Porters	Store Keepers, Washers, and Guards	Total
East Shoa	11	33	472	192	625	82	1,404
Arsi	5	15	164	73	230	35	517
West Arsi	4	12	198	94	318	33	655
West Hararge	3	9	126	63	217	26	441
Grand Total	23	69	960	422	1,390	176	3,017

Project Management and Administration

During this quarter, the IRS program in Ethiopia received Deputy Director, RTI Center for International Health (Brad Lucas), for general management support; RTI Regional Finance Manager (Sam Mesfin), for support on financial management; and Dr. Adam Wolkon from the Centers for Disease Control and Prevention (CDC) for training of trainers on programming and use of personal digital assistants (PDAs) for geocoding and pilot mapping; and benefited from the process of RTI registration in Ethiopia.

Partnership and Collaboration

The IRS Ethiopia team was a member of the Coalition Against Malaria in Ethiopia and of PMI Partners in ORHB. The RTI team in Ethiopia participated in a one-day partners' meeting on January 13, 2010, and presented the activity performance for 2009 and the plan of action for FY 2010 that was organized by ORHB. Two of the project staff also gave technical support on training of malaria prevention and control that was organized by the FMOH during the time of February 1–28, 2010.

Outstanding Activities

- Mapping and geocoding of house structures for better targeting and quality of IRS operation
- Modification of evaporation tanks to soak pits as well as construction of new soak pits in newly added districts

Upcoming Activities

- Work on geocoding and mapping of structures
- Rehabilitation of district storage facilities in seven newly added districts
- Modification of evaporation tanks to soak pits in previous project districts and construction of soak pits in newly added districts
- TOT on spray pump maintenance and use

- Training on insecticide poison management
- TOT for 2010 IRS implementers
- IRS operations in 30 districts (five zones) in September 2010

Ghana

Background

In December 2006, Ghana was selected as one of the 15 focus countries in a five-year, \$1.2 billion initiative to scale up malaria prevention and treatment interventions in high-burden countries in sub-Saharan Africa. With funding from the United States President's Malaria Initiative (PMI) and the United States Agency of International Development (USAID), RTI International continues its support of this initiative in Ghana through the Indoor Residual Spraying 2 (IRS 2) Task Order One project, the follow-on contract to IRS 1.

For IRS 2, RTI is partnering with Crown Agents USA (CA-USA) for procurement and logistics services; Medical Research Council of South Africa (MRC) for entomological monitoring technical assistance; and Meridian Group International for information, education, and communication (IEC) and behavior change communications (BCC). In Ghana, RTI subcontracts with Noguchi Memorial Institute for Medical Research (NMIMR) for entomology and capacity building.

Ghana is now in its Year 3 planning cycle for FY2010. In Year 3 of the PMI/USAID IRS program, PMI and the Ghana National Malaria Control Program (NMCP) have mutually agreed to support IRS activities in nine districts of Northern Region. IRS will take place in eight districts—six previously sprayed districts and two new ones. In an additional new district, Bunkpurugu-Yunyoo, PMI will support baseline entomological studies and epidemiologic studies in 2010, with plans to commence IRS in 2011.

RTI is tasked with providing strategic, technical, management, and operations support for IRS activities in these districts. RTI and the NMCP plan to treat at least 80,000 houses and protect over 800,000 people with residual insecticide in eight districts during the third round of IRS, scheduled to begin May 3, 2010.

This semiannual report presents the program's progress toward achieving these objectives in Ghana from January 1, 2010–March 31, 2010, and summarizes the program's current activities and achievements, outstanding issues, and upcoming activities.

Current Activities and Accomplishments

Planning and Assessment

The Ghana IRS program held microplanning meetings in all targeted districts with relevant stakeholders. The RTI team made geographical reconnaissance visits to all of the IRS beneficiary districts to assess their preparedness for IRS operations for 2010. Operational and logistics assessments were carried out during these visits.

A series of meetings has been organized in both Accra and Tamale to review technical and administrative operations for the third round of IRS operations.

Collaboration between RTI, District Health Management Teams (DHMTs), and the District Assemblies have been very cordial. These partners assisted RTI to secure offices, warehouses, storerooms, and soak pit sites for the spray operations in all eight districts. The

RTI field team assessed all district operational sites and made note of locations that need rehabilitation or refurbishment. In new districts, new soak pits will need to be constructed and operational sites will require additional rehabilitation.

Comments and suggestions received from the USAID Contract Officer’s Technical Representative (COTR), Centers for Disease Control and Prevention (CDC), and PMI advisors on the FY 2010 work plan and budget were addressed; a revised work plan and budget were resubmitted to USAID, and approved on March 30, 2010.

Preparatory activities for the third round of operations are on course, with spray equipment being serviced and maintained.

Procurement and Logistics

The logistics officer on the Ghana IRS program resigned his position in January 2010, and recruitment for a new logistics officer began immediately. A new logistics officer assumes duty on April 1, 2010.

The chief of party (COP) initiated discussions with RTI Procurement and the IRS technical program manager (TPM) on procurement requirements for the third round of operations. A letter on the selection of pyrethroid insecticide class was received by RTI from the NMCP, and it was forwarded to the RTI home office and USAID/CDC Advisor for the necessary action. This is a procurement requirement and also informs the international competitive bidding process for the selection of insecticide class.

A task order was issued to CA-USA to begin procurement of the international commodities required for Ghana’s third round of IRS.

Table 1 lists items included in the procurement.

Table 1: International Commodities Procurement

	Name	Quantity
1	Insecticide: Class – Pyrethroids	Sachets: 88,104
2	Dust masks: 3M model 8511, N95 Particle Respirator	52,325
3	Overalls	Large: 450 Medium: 240
4	Reflective vests	Dark green: 80 Red or orange: 50
5	Pregnancy test kits:	300
6	Digital thermometers	15
7	Hard hats	250
8	Face shields	250
9	Compression Spray Pumps 10-liter sprayer	168
10	Sprayer repair kits	16
12	Pressure gauge assembly	50
13	Extension tube assembly	10
14	Shutoff valve body cap	25
15	Hose only	50
16	Male fitting for strainer housing	25
17	Filter nylon	50

In February 2010, a request for local bids for the procurement and supply of print materials, equipment, rental of vehicles, and computers was placed in the national daily newspapers. The bids received were assessed per solicitation criteria, and successful bidders were contacted and engaged for IRS operations.

Environmental Compliance

In this reporting period, the Ghana IRS team visited all the IRS operational sites in the eight beneficiary districts to ascertain first hand the state of soak pits and what measures must be taken to ensure environmental compliance procedures.

Information, Education, and Communication

The Ghana IRS program worked with the NMCP Communication Task Team to review IEC materials for the third round of operations. The IEC officer and the Tamale team conducted community mobilization/entry activities in the eight IRS targeted districts. The team interacted with District Chief Executives, District Directors of Health Services, traditional leaders, and district assembly members.

Community stakeholder meetings were organized at the district and sub-districts level in all of the eight IRS targeted districts. Participants included among others, District Assembly staff, staff of the District Health Directorate and health centers, heads of decentralized departments, district assembly members, traditional leaders, religious leaders and other opinion leaders. Discussions at all the meetings had been very fruitful and very successful.

Entomological Monitoring/Capacity Building of Ministry of Health

The scheduled monthly entomological evaluations for monitoring vector behavior, densities, and bioassays for the January–March 2010 were conducted. The Ghana Health Service (GHS) field supervisors were mobilized for the exercise and were coordinated by the Northern Region biologist, the RTI entomologist, and the monitoring and evaluation (M&E) officer. NMIMR provided oversight and supervisory functions during the field evaluations and laboratory activities. The RTI Ghana team visited the Navrongo Health Research Centre to discuss collaboration efforts in the management and support of the Tamale field insectary.

Monitoring and Evaluation

All RTI districts offices are being set up, and a targeted population of about 800,000 is expected to be protected by IRS in all eight districts. The spray cards used in the last round are being reviewed for this round; data recording systems are also being reviewed and revised to ensure that accurate data are reported.

RTI continues to track the progress of work at the district level, and weekly progress reports are submitted to the M&E coordinator. Training facilities at the district level for the spray operator training have been identified, and preparations are underway for recruiting IEC implementers and spray operators. New operational sites have been selected, and all necessary resources are being mobilized. Soak pits areas are under construction for the third round of spray operations.

Project Management and Administration

Staff were recruited for temporary district positions during this period. Advertisements for vacant positions were placed in national daily newspapers. Short-listed candidates were interviewed, and selected candidates have been deployed to the districts to manage IRS operations.

Weekly staff meetings were held to address human resources, technical, and other operational challenges in the Ghana IRS program.

Partnership and Collaboration

The Ghana IRS team participated in the GHS Annual District Health Performance Review meetings from February 1–5, 2010, across all six IRS beneficiary districts from the 2009 spray round. A progress report on the previous IRS rounds (2008 and 2009) and an overview of FY 2010 spray operations were presented by the RTI M&E officer and district operation managers.

From February 17–19, 2010, the Ghana IRS team also participated in the Annual Northern Regional Health Performance Review meeting in Tamale. A presentation on the malaria situation in the Northern Region by the Regional Malaria Focal Person indicated a reduction in cases in the IRS beneficiary districts as compared to the non-IRS beneficiary districts. This has formed the basis for an assessment of the impact of IRS on malaria burden in the Northern Region, scheduled to take place during the next quarter by USAID, CDC, GHS, and other partners.

Upcoming Activities

- District staff orientation
- Selection and recruitment of spray operators
- Selection and recruitment of IEC implementers
- Training of trainers workshop for IRS operations to be attended by District Disease Control Officers, District Environmental Health Officers, and RTI district staff. Partners expected at this training include USAID/PMI, NMCP, NMIMR, Zoomlion and Anglogold Ashanti Malaria Control Program.
- Regional stakeholders meeting for eight IRS beneficiary districts
- District level spray operator training
- Training for district IEC implementers
- Environmental compliance pre-spray inspection
- Launch spray operations
- Entomological technician training
- World Malaria Day celebrations, April 25, 2010
- Pesticide management training
- Start spray operations on May 3, 2010

Madagascar

Background

The U.S. Agency for International Development (USAID), under the U.S. President's Malaria Initiative (PMI), awarded RTI International a contract to work with stakeholders in Madagascar to implement indoor residual spraying (IRS). RTI, through the IRS task order 1, has previously assisted the National Malaria Control Program (NMCP) with its IRS activities supporting targeted spraying in six regions (24 health districts) in the Central Highlands (CHL) in 2007 and generalized spraying in six health districts in 2008. In 2009, RTI provided strategic, technical, management, and operations support to implement the Ministry of Health and Family Planning's/NMCP's and USAID's goal of reducing malaria-associated mortality in the same six targeted districts during this third round of spraying activities. For administrative purposes, Betafo/Madoto was considered two separate administrative areas in 2009, making up seven spray districts in total (still one health district). RTI also procured insecticide and other equipment, managed logistics and the transportation, and handled storage and security of all commodities on behalf of the PMI and the IRS program. During the November 2009 spray round, in response to the political crisis, PMI reprogrammed fiscal year 2009 funds from activities that would have required working with or engaging the Government of Madagascar to activities using international and local nongovernment organizations as implementing partners. As such, RTI identified the Malagasy Red Cross (MRC) as our local implementing partner for the 2009 spray round. Other partners include the Roll Back Malaria (RBM) Committee, district health offices, the Ministry of the Environment, and the Institut Pasteur de Madagascar (IPM) for entomology.

This quarterly report presents the IRS program's progress in Madagascar from January to March 2010 and summarizes the project's current activities and achievements, outstanding issues, and upcoming activities.

Current Activities and Accomplishments

Procurement and Logistics

Ground reconnaissance was carried out in the CHL region to record data on population and structures. The data will be used to inform the logistics needs assessment for the 2010 IRS round.

Insecticide

The RBM vector control subcommittee identified the insecticide family for the next campaign. Based on the results shown in the entomological evaluations in 2009, the pyrethroid class was selected for the CHL and the carbamate class was selected for the fringes and the new extended districts (South and West). The official letter from the Ministry of Health, Family Planning and Social Protection will be sent as soon as it is available.

Environmental Compliance

At the end of the November 2009 spray round, the solid waste from RTI's two intervention regions (Fianarantsoa and Antananarivo) was collected and stocked in a central warehouse at PROCHIMAD in Ivato, Antananarivo. The waste was stored separately from the other warehouse inventory and according to environmental compliance standards. The empty insecticide sachets were packed in boxes and stored until incineration.

RTI staff visited the ADONIS incinerator with a representative from the Ministry of the Environment. Other ministry officials requested visits to the incinerator site before formal approval could be given. Those visits will take place in the subsequent quarter. RTI is also waiting for ADONIS's license to be extended before it can be used to incinerate IRS waste.

Spray Operations

RTI held a meeting with the MRC staff to review the November 2009 IRS spray round.

In this quarter, the RBM committee and the NMCP discussed expanding into 10 new districts in addition to the current districts in the CHL. This is still under discussion and has not been officially confirmed.

Other Activities

Entomological Monitoring

IPM is responsible for carrying out the entomological monitoring activities as a subcontractor to RTI in Madagascar. They are currently working on the postspray evaluations and are collecting data on the following entomological indicators:

- Susceptibility
- Residual efficacy
- Vector behavior
- Species identification

The results of the evaluations will be available in the next quarterly report.

Monitoring and Evaluation

Final results from the 2009 spray round were released in early January 2010. The compiled data on spray coverage per structure showed that 95.74% of all found structures were sprayed. In all, 1,274,809 individuals were protected against malaria in the seven districts in the 2009 spray round, out of which 25,420 were pregnant women and 203,664 were children under five (see Table 1).

Table 1: Structures Sprayed and Population Covered

District	Structures			Population				
	Found	Sprayed	%	Total Population	Total Population Protected	%	# of Children <5 years	# of Pregnant Women
ANJOZOROBE	32,941	32,069	97.35	181,502	181,013	99.73	27,486	2,926
ANKAZOBE	26,172	24,239	92.61	135,170	133,549	98.8	37,818	3,804
BETAFO	49,307	46,072	93.44	247,543	243,208	98.25	33,979	3,363
MANDOTO	23,605	22,831	96.72	135,190	131,806	97.5	26,557	2,320

District	Structures			Population				
	Found	Sprayed	%	Total Population	Population Protected			# of Pregnant Women
					Total Population Protected	%	# of Children <5 years	
AMBATOFINANDRAHANA	22,650	22,514	99.40	165,313	155,953	94.34	21,492	2,460
AMBOHIMAHASOA	36,716	35,714	97.27	227,339	219,316	96.47	35,966	5,599
AMBOSITRA	34,294	32,621	95.12	213,432	209,964	98.38	20,366	4,948
TOTAL	225,685	216,060	95.74	1,305,489	1,274,809	97.65	203,664	25,420

Project Management and Administration

- All spray operations district seasonal staff contracts were terminated and all payments were completed.
- The subcontract with the MRC was closed out and all outstanding invoices were paid.
- The RTI office lease was renewed.
- The End of Spray Report was drafted and submitted to the Technical Program Manager.

Upcoming Activities, April to December 2010

- Draft the 2010 Madagascar Work Plan
- Assess logistics and procurement for the 2010 round
- Pre-inspect the IRS districts
- Develop Supplemental Environmental Assessment amendment for the new extended areas
- Write entomological monitoring report
- Conduct next IRS round in November 2010

Mali

Background

The indoor residual spraying (IRS) project in Mali is funded by the United States Agency for International Development (USAID) and the United States President's Malaria Initiative (PMI) to support the *Programme National de Lutte contre le Paludisme's* (PNLP's, or National Malaria Control Program) IRS campaign that targets Bla and Koulikoro districts. In 2009, the IRS program sprayed 126,922 structures (93% of the targeted structures), protecting a total population of 457,374 in Bla and Koulikoro districts. Moreover, the IRS team trained 2,607 persons in support of spray operations, including 424 spray operators, 43 team leaders, and 1,951 information, education, and communication (IEC) mobilizers.

RTI International leads IRS implementation in collaboration with the PNL, National Center for Information, Education, and Communication; Ministry of the Environment; African Program on Pesticide Stocks; Ministry of Agriculture; Malaria Research Training Center; referral hospitals in Bla and Koulikoro districts; and community health centers.

This quarterly report presents the program's progress in Mali from January 1 to March 31, 2010, and summarizes the project's current activities and achievements, outstanding issues, and upcoming activities.

Current Activities and Accomplishments

During this quarter, we focused on the program planning activities for the 2010 Mali IRS Program, finalizing the needs assessment, and beginning the procurement process for local and international equipment and insecticides. The spraying is scheduled to occur between May 15 and June 26.

Planning and Assessment

Microplanning

Efforts this quarter were dedicated to the participative microplanning of the 2010 IRS activities. This planning began at the national level where RTI organized working sessions with PNL and CNIECS. A draft of the planning session was created and circulated to our colleagues at the district level (Health and Social Development; Figure 1) and health community level—Health Community Association and the Head of the Health Community Center. Through this participatory approach, we were able to capture operational information/feedback that informed our document.

After that exercise, we presented the microplanning document at the regional level where we shared it with the different regional directors involved in the Mali IRS Program in Koulikoro and Segou Regions, including Regional Directors of Health, Regional Director of Environment, and the Regional Director of Social Development.

The last step was to present that microplanning document to the IRS Steering Committee prior to the start of the spray season. The involvement of all those levels in the microplanning will facilitate the implementation of the Mali IRS activities during the 2010 IRS Campaign.



Figure 1: Bla 2010 IRS microplanning: Health district, NMCP, and RTI International/Mali teams

Update of the Geographical Reconnaissance (for the compounds)

During the mop up of the 2009 IRS campaign, it was difficult to differentiate between the sprayed houses and the unsprayed houses. It was also difficult to identify the operators who were responsible for the unsprayed houses or those that were incorrectly sprayed. To better monitor this, we conducted a census of all the compounds in the two districts—and assigned each compound a number—and updated our data accordingly. During the spray campaign, each operator will be responsible for their assigned compounds/structures in specific areas.

In so doing, we have organized the data to facilitate easy identification of unsprayed houses and responsible spray operator during the 2010 mop up.

Chronogram of Operators

Based on the number of rooms for each health area, we calculated the number of corresponding operators for each area. Knowing the number of rooms that each operator can spray per day, we then determined the number of the days that it can take to spray each village.

With this information and some examples, the Medical Post Chiefs have created a chronogram of operators for their health areas, so that the supervisory team knows in which village spray operators are located. Medical Post Chiefs created the 2010 chronogram under the supervision of the Head of Health Center of Reference and the Chief of the Social Development.

Procurement and Logistics

The request for proposal (RFP) announcement for mini-cars that will be used during the 2010 IRS round was published in the national and daily newspaper. The RFP for local procurement

plan (e.g., office consumables, field consumables-services, and field consumables-general support) will be published in the next quarter.

Environmental Compliance

The logistician visited all 42 IRS sites and provided valuable information about the condition of the secondary stores, the soak pit, and the washing area. Once hired, the environmental consultant, among other duties, will be responsible for repairing the infrastructure based on the logistician's recommendations.

Information, Education, and Communication

The IRS team organized a meeting with community leaders in Bla and Koulikoro in March to

- share the 2010 IRS microplanning
- assist in selection process for spray operators and IEC mobilizers.

Spray Operations

The Mali IRS Program has begun conducting geographic reconnaissance of compounds in 25 health areas in Bla and 17 health areas in Koulikoro. The lists of heads of the compounds with structures and rooms numbers were established. With these data, the number of spraying operators was calculated and the spraying calendar was fleshed out by the community health workers for all health areas in Bla and Koulikoro.

Other Activities

Entomological Monitoring

The MRTC shared the results of the operational research on IRS near the Niger River and prevention of adverse environmental consequences, and organized a workshop on the results of the operational research study at Bancoumana on January 19, 2010.

Capacity Building of Ministry of Health

There were no specific MOH capacity building activities undertaken in the reporting period.

Monitoring and Evaluation

No M&E activities occurred during the performance period.

Project Management and Administration

Partnership and Collaboration

All meetings and workshops were prepared in conjunction with PNLN.

CNIECS has participated in the preparation and the facilitation of the meetings with Community Leaders in Bla and Koulikoro districts.

Outstanding Activities

- Selecting the provider of the mini-buses and all vehicles for use during the 2010 IRS campaign
- Finalizing the Chronogram of Operators' activities

- Hiring the M&E and the Environmental consultants

Upcoming Activities

- Training of Trainers will begin in Segou on March 29
- Training of spraying operators
- Training of Trainers for IEC mobilizer training
- Training of IEC mobilizers
- Training of temporary personnel
- Spray campaign will start on May 15, 2010.

Mozambique

Background

Mozambique was identified by USAID as one of the second wave of countries to receive funding under the United States President's Malaria Initiative (PMI). The United States Agency for International Development (USAID) and the Mozambique National Malaria Control Program (NMCP) identified six epidemic-prone districts (Quelimane, Nicoadala, Namacurra, Morrumbala, Milange, and Mocuba) for indoor residual spraying (IRS) activities. In 2007, USAID and the NMCP agreed to support spraying activities in a total of about 48 localities in all six districts with the intention of continuing coverage in these areas in future IRS campaigns.

The 2009 IRS activities began in March with the annual microplanning meeting in Mocuba district involving all district malaria team members from the six targeted districts, as well as the provincial health team and IRS support team. During the campaign, 590,031 structures were visited, out of which 571,194 were sprayed that yielded a coverage of 97%. The 2009 IRS campaign in Zambezia was launched on July 11, 2009 and ended on October 2, 2009. As in previous spray campaigns, the highly inaccessible structures in these districts were not targeted.

This quarterly report presents the project's progress in Mozambique during the period from January 1 to March 31, 2010, and summarizes current activities and achievements, outstanding issues, and upcoming activities.

Summary of Current Activities and Accomplishments

During the current quarter, the program carried out the following post-spray season activities:

- Stock balancing, repair of personal protective equipment (PPE) and other IRS material
- Submission of the final end of spray report in February 2010
- The INS molecular entomology lab was completed and formally handed over to the government.
- Development of the FY10 work plan began in February and ended in March. However, after the work plan was submitted, PMI requested RTI to include two additional districts in Zambezia province, Mopeia and Maganja da Costa, for the 2010 IRS campaign. The plan and budget have been updated to include the new districts, and the revised work plan will be resubmitted to PMI in April 2010.
- All 23 wash slabs and evaporation tanks and the five district base storage/office complexes completed last year were officially handed over to the Provincial Department of Health (DPS).
- All DDT waste material from previous IRS campaigns supported by PMI was transported to South Africa for safe disposal in March 2010.

- Refurbishment of the molecular entomology laboratory in Maputo was completed and officially handed over to the government in February.
- Rehabilitation of the Pemba entomology lab started in March. Two 20-foot containers were transported from Nicola to Pemba and were mounted on cement bases at the premises of the Wimbe Health Center in Pemba. The containers were covered with a steel frame and iron sheets. Local contractors will complete work on the interior of the lab in the coming months.

Planning and Assessment

As this was the quarter immediately following the IRS season, planning and assessment activities were minimal. RTI and DPS travelled to Mopeia and Maganja da Costa districts, the two new districts targeted for IRS in 2010, to make field assessments and complete geographical reconnaissance in order to guide planning and budgeting for the 2010 IRS campaign. The information gained from the visit was used to make modifications to the budget and work plan incorporating the two new districts. Subsequent to formal approval from PMI, the final revised work plan, which plans for eight districts, will be submitted to PMI in April 2010.

Crown Agents completed the final payments of IRS seasonal personnel, after which they officially terminated their activities in Zambezia and closed their temporary field office at the end of November 2009. The payment of incentives for community leaders who participated during the IRS mobilization efforts was handled by the RTI team.

Procurement and Logistics

Pesticides

Under the agreements between PMI and the NMCP, insecticides for the Zambezia province IRS program are provided by the Ministry of Health (MOH). Therefore, no activity on insecticide procurement and logistics took place during this period.

Spray pumps and parts

All the spray pumps and PPE used during the spray operation in districts were collected, sorted, repaired if necessary, and stored for future use. These activities were supported by the RTI logistic officers, the temporary hired storekeepers, and the repair technicians.

Personal protective equipment

RTI secured quotes and a subsequent local purchase order for the procurement of PPE and other IRS materials for the 2010 season. The local procurement process has begun and the commodities will be available well in advance of the spray season.

Other Commodities

Information management material (computers and accessories) from IRS 1 are still in RTI's possession pending a decision on the official handover to the DPS and DDS.

Environmental Compliance

All 23 wash slabs and evaporation tanks and the five district base storage/office complexes that were completed last year were officially handed over to the DPS. However, following a request from the district health offices, RTI completed some maintenance work on a few of the sites after the handover. Together with the district authorities, RTI made plans for maintenance and improvement of some of the fencing at these sites during the development of the FY10 work plan in February. As Zambezia shifted into the rainy season, RTI, together with the district authorities, monitored wastewaters in the evaporation tanks. Daily monitoring of the evaporation tanks was carried out and during the last week of November, RTI made the decision to pump all remaining wastewaters into plastic tanks for safe storage. Meanwhile evaporation tanks were allowed to dry and all residue material was collected and stored for safe disposal.

Baseline results on DDT residues in crop and soil samples were analyzed, and the final report was shared with PMI in January 2010. The results were delayed because quality assurance/quality control results received from the laboratory contracted to analyze the samples were determined to be unreliable—it appeared that the lab had systematically under-reported total DDT. Thus, the samples were transferred to a new lab in Nairobi for analysis. DDT was detected in 56 out of 68 (82%) of the crop samples analyzed, with detectable total DDT concentrations ranging from trace to 3.641 mg/kg and in 122 out of 137 (91%) of the homestead soil samples analyzed, with detectable total DDT concentrations ranging from trace to 3.9 mg/kg. The median concentration in the crop samples was 0.036 mg/kg, just below the CODEX standard (0.05 mg/kg) used by the European Union for crops destined for export.

All DDT waste material from IRS campaigns supported by PMI was transported to South Africa for safe disposal in March 2010. All materials stored in the Quelimane warehouse were transported by Enviroserve, a company based in Maputo, and were shipped to South Africa after securing appropriate authorizations from the Basel Convention and the Ministry of Environmental Affairs in both countries.

IEC Development and Implementation

IEC material design and development

No activity in this area.

Training of IEC mobilizing agents

No activity in this area.

IEC campaign implementation

No activity on IEC related to IRS operations took place during this period. However, RTI is working with the NMCP and the DPS to prepare activities for World Malaria Day on April 25, 2010. In Zambezia, the event in Zambezia will take place in Mopeia district, one of the new districts targeted for in 2010 season. RTI will support the event by assisting with logistics and donating T-shirts for the event.

Coordination with spray operations

No field activity occurred during this period; however, RTI worked with the DPS team to plan for the expansion of IRS to Maganja da Costa and Mopeia. To produce budget estimates for the expansion, RTI and DPS quantified the number of additional temporary workers, PPE, and other items that would be needed to implement IRS in the two new districts. PMI approved the updated budget; RTI will now need to update the work plan to include the new districts.

Spray Operations

Geographic reconnaissance and detailed planning

The RTI technical team assisted with the preliminary DPS field visits to Mopeia and Maganja da Costa districts to clearly define the targeted spray areas and enumerate the target structures. The data are being used for planning the 2010 campaign and will be incorporated into the 2010 work plan.

Recruitment and orientation for district administration

No activities occurred during the reporting period.

Environmental mitigation set-up

No activities occurred during the reporting period.

Recruitment and training for spray teams

No activities performed during the reporting period.

Logistics support for spray operations

No major activities, though the final stocktaking and repair of pumps was done during this period. Materials are safely stocked in the RTI warehouse.

IRS final coverage data

The end of spray round report was submitted to the PMI during February 2010. The report contained all the final data related to the 2009 IRS operation in six districts. The program was initiated on 11 June and ended officially on 2 October. During 12 weeks of field operations (62 days of actual field work), 571,194 structures were sprayed out of 590,031 structures found, yielding 97% coverage of IRS in the target area.

Post-Spraying Operations

Post-spray operations were focused mainly on the stock balancing of IRS/PPE material and the repair and selection of suitable items for the next season.

Demobilization of the spray teams, closing down of temporary district base, recollection of material and insecticide from bases to the district bases, finishing the payment of IRS personnel at the district level were done in last quarter in 2009.

Other Activities

Entomological Monitoring

Monthly window trap collection the six target districts was carried out during the reporting period. Tests for insecticide resistance following the World Health Organization (WHO) protocol were also done. Liverpool Associates for Tropical Health will report on the results of the entomology monitoring in their final report to RTI.

RTI helped to support the annual nationwide entomological monitoring and surveillance program carried out by the NMCP in four sentinel districts in the north, center, and south of the country. Four teams collected mosquitoes from sprayed and unsprayed areas in each location using both flit and manual collection methods. Larvae were also collected and used for the WHO susceptibility studies in each locality. Temporary larvae rearing facilities were set up. This work will be done in three phases from March to May 2010.

As mentioned above, RTI enlisted a local contractor to refurbish facilities for a basic entomology lab in Pemba in the northernmost province of Cabo Delgado. Additionally, the local contractor hired to remodel the molecular entomology lab at the Instituto Nacional de Saúde (National Institute of Health) in Maputo completed the work and the refurbished lab was officially handed over to the government.

Capacity building of MOH (surveillance, M&E, etc.)

No specific capacity building activities were conducted.

Baseline environmental monitoring

No activity performed during the reporting period.

Monitoring and Evaluation

Information collection plan

Rechecking of IRS weekly coverage data was done before the development of the end of spray round report.

Progress on key indicators

Progress on the key indicators were reported in the end of spray round report to the PMI.

Project Management and Administration

Staffing

Recruitment for the Provincial Coordinator position occurred during this quarter. We reviewed about 35 applications, and interviewed three final candidates. The results were sent to the Nairobi Regional Office in March 2010 for finalization of interviews and a final offer to the selected candidate. The process is pending action from the Nairobi office.

The Logistics Coordinator position was also advertised. RTI received about 60 applications in response to the positing. After an initial screening, five candidates were short listed. The continuation of the recruitment process has been handed over to the regional office.

The current interim COP will be replaced by another candidate chosen by regional office and approved by PMI. The new COP will start work on April 19, 2010.

Administrative support (includes summary of oversight and support from the Nairobi regional Office)

All routine office management activities for the CCN staff and local service requisitions are handled by both the Maputo and Quelimane offices consisting of a permanent staff of 13 individuals. The RTI Nairobi Regional Office and the US-based home office supported the RTI Mozambique office on routine administrative matters, monthly financial reports, environmental monitoring issues, and report editing and submission.

Office and warehouse space

A central office in Maputo and a field operations office in Quelimane were maintained during the reporting period. Two warehouse buildings in Quelimane city (one for storage of PPE and pumps and the other for insecticide waste and unused insecticide), as well as their security services, were also maintained during the reporting period.

Partnership and Collaboration

National partners

The final memorandum of understanding with the NMCP/DPS for the 2010 season is pending finalization of the fiscal year 2010 work plan.

USAID partners

RTI held on an ad-hoc basis with USAID/PMI, the NMCP and the INS to discuss IRS implementation, waste disposal, environmental compliance, capacity building for entomological research and survey activities, expansion of IRS operations, and mechanisms for increased support of entomological and IRS activities at the central level.

Outstanding Activities

- Procurement of four vehicles.
- Improvement of the fencing at some of the evaporation tank sites
- Recruitment and hiring of the Provincial Coordinator and the Logistic Officer.
- Signing of MOU with DPS
- Submission of final 2010 work plan to PMI

Upcoming Activities

- Microplanning meeting for the 2010 IRS season in Zambezia
- Malaria day activities on April 25
- Completion of water supply to Milange main base center
- Completion of the entomology lab in Pemba
- The new COP will begin working on April 19

Rwanda

Background

Rwanda is one of the second waves of countries to receive funding under the United States President's Malaria Initiative (PMI) for implementation of the indoor residual spraying (IRS). In 2006, USAID and the Rwandan Ministry of Health (MOH) and Programme National Intégré de Lutte contre le Paludisme (National Integrated Malaria Control Program [PNILP]) identified the three epidemic-prone districts of Nyarugenge, Gasabo, and Kicukiro in Kigali Province for IRS activities. In 2008, Kirehe and Nyanza districts were added to make five districts. In 2009, two additional districts were added—Bugesera and Nyagatare, respectively, in the Southeast and East, both in the Eastern Province of the country. In early 2010, after discussions with PNILP on entomological and epidemiological findings, PMI agreed to support a reduced scale of IRS in March. This round, while not in the Malaria Operational Plan for 2009, was carried out successfully, targeting only the Gasabo and Kicukiro districts.

RTI provides strategic, technical, management, and operations support for IRS activities in the selected districts in Rwanda. This quarterly report presents the program's progress in Rwanda from January 1 to March 31, 2010, and summarizes the project's current activities and achievements, outstanding issues, and upcoming activities. Activities during this quarter focused on planning and preparations and implementation for the reduced-scale March spray round. Activities also included developing local and international procurement list of materials and equipments, selection of vendors, recruitment and training of seasonal workers, establishment of offices, refurbishment of operational sites, distribution of spraying materials in new districts, transport management, and implementation of the spray round in Gasabo and Kicukiro.

Current Activities and Accomplishments

Planning and Assessment Planning

From January 12 to 15, the IRS Nairobi Regional Office Director Dr. John Chimumbwa visited Rwanda and participated in several meetings with PNILP on planning for the fifth round of spray operations. During his visit, Dr. Chimumbwa met with the PMI advisor and PMI environmental officer, and PNILP leadership. Dr. Chimumbwa discussed the option of the March spray round with the PNILP and PMI and it was determined that the decision on whether to implement IRS in March would be based on the interpretation of entomological data, HMIS data sharing, acceptance in waste disposal and resource constraints. In late January, PMI agreed to support PNILP to implement a reduced-scale IRS round in March.

Ms. Catherine Ngugi arrived in Rwanda on February 4, 2010, to act as the interim COP during the March spray round and preceding planning period. She held various planning meetings with PNILP, PMI, and PSI on information, education, and communication (IEC); spray operator recruitment and training; target area selection; and general IRS operations. She worked closely with the PNILP to develop the fifth round operational plan.

Procurement and Logistics

Early in the quarter, the Logistics Manager developed a list of required local materials. He sought competitive bids for vehicle rentals and made final vendor selections based on the solicitation criteria.

Throughout February, Logistic Assistants distributed equipment, insecticides, and materials from district storage facilities to sector operational sites in preparation for the IRS launch.

The IRS Logistics Manager evaluated soak pits and operational sites in the two spray districts and noted and procured the necessary materials needed to complete the refurbishment were noted and procured. In late February, RTI team constructed eight new soak pits and refurbished six additional soak pits in all sectors.

We were able to use the remaining insecticide stock of deltamethrin (WG 250) from previous IRS campaign for this one. Adequate storage facilities were identified facilities and rented in all 14 sectors for supporting operations. The main district storage facility required minor maintenance involving the installation of shelves to improve storage and maximize space.

Environmental Compliance

In preparation for the March spray round, the RTI Regional IRS Environmental Manager, Tito Kodiaga, traveled to Rwanda for a pre-spray environmental inspection from February 11–15. He conducted site visits to observe IRS preparatory activities and to determine and document whether the IRS program complied with USAID requirements as included in the approved SEA or otherwise. Mr. Kodiaga recommended immediate and long-term corrective actions to resolve noncompliance issues. He also visited the Kanombe Military Hospital with the RTI Monitoring and Evaluation (M&E) Manager to arrange for the start of incineration of the IRS waste. Incineration commenced on Jan 19, 2010. During February 2–31, approximately 2,857 kg of IRS waste was incinerated.

Mr. Kodiaga returned to Rwanda on March 15, 2010, to carry out the mid-spray inspection. This inspection focused on ensuring that spray operations were being implemented according to the environmental compliance regulations. He assessed the use of soak pits and PPE, warehouse conditions, and general handling of the insecticide.

Spray Operations

Training

The training of trainers was held February 15–19, 2010, in Kigali. In total, 78 trainers were trained during the session. Participants included PNLP staff and district health staff. The spray operator training was conducted February 22–26, 2010, and a total of 855 spray operators from the two targeted districts, Gasabo and Kicukiro, were trained. After training, all spray personnel were given a general medical exam to ensure that all were adequately fit for the spray activities. Furthermore, women were given pregnancy tests; pregnant women were reassigned to other positions that did not involve contact with insecticide.

The spray round was launched on March 1, 2010. The target area included 14 sectors in two districts of Gasabo and Kicukiro within Kigali City. A total of 72,494 structures were found, out of which 63,395 were sprayed. The total percentage spray coverage was 87.4%. Table 1 shows the outcome of the March 2010 spray round.

Table 1. Outcome of March 2010 Spray Round

District	Number of Structures found	Number of structures sprayed	Percent Coverage	Population	Number of Children <5yrs	Number of Pregnant women	Number of Sachets used	Ratio Sachets per structure
Gasabo	51,101	43,137	84.4	188,613	28,362	2,767	31,404	1.37
Kicukiro	21,393	20,258	94.7	92,219	12,940	1,311	16,781	1.21
TOTAL	72,494	63,395	87.4	280,832	41,302	4,078	48,185	1.32

End of Spray Round Activities

The spray round ended on March 22, 2010. From March 23 to March 31, equipment, materials, PPE, and insecticide were collected from sector store rooms and transported to the district warehouses. Once at the district warehouses, the Logistics Assistants and the Logistics Manager, ensured that all equipment was accounted for, cleaned, and sent for maintenance if needed. From April 1 to April 15, the IRS team conducted a thorough IRS post-spray inventory of all seven districts to have accurate numbers of current stock for planning of the August spray round. Soak pits and operational sites were closed and secured for use in the August spray round.

Information, Education, and Communication

PSI is responsible for IEC component in Rwanda IRS Program. Because of IEC challenges that were presented during the four previous rounds, PMI organized several planning meetings to discuss new strategies for improving the IEC component. Participants included RTI, PNILP, PSI, and PMI staff.

A refresher training for IEC implementers was conducted in 14 sectors on February 20, 2010. A total of 2,084 IEC implementers were trained.

This spray round faced some challenges in the area of IEC. The community IRS acceptance rates were lower than desired. RTI, PSI and PNLP held many meetings to trouble shoot the IEC situation in order to improve the acceptance rates. The local sector leaders were asked to participate in the community IEC activities to improve coverage during the mop-up. PNILP assured the IRS leadership team and RTI field staff that the coverage in these areas has been historically low and that it is not a new situation. However the concern over the quality and effectiveness of the IEC activities continues to be raised with PSI. IEC lessons learned and recommendations will be presented in the end of spray report, which will be finalized in the next quarter.

Entomological Monitoring

PNILP, PMI, and RTI met to review the findings from the December 2009 wall bioassays from the post-spray monitoring. Based on monitoring results that showed some areas of lower residual effect of the insecticide, PNILP decided to implement the reduced spray round in March.

RTI consultant, Enock Mpanga, has been working in Rwanda this quarter conducting wall bioassays in the districts of Kicukiro and Gasabo, where spraying took place in March. Preliminary findings from Kicukiro and Gasabo were sent to USAID for review.

The insectary renovation has been completed. RTI and PNILP have identified the necessary materials for entomology evaluations to be performed in the insectary. With the support of the IRS Program, equipment and materials needed were procured locally. Items procured include a refrigerator, generator, wall heater, humidifier, and electric regulators.

Upcoming Activities

- Prepare end of spray round report
- Orient new COP
- Review results of entomological monitoring activities
- Procure materials for August spray round
- Conduct SEA training for PNILP participants
- Coordinate August 2010 spray round planning meetings

Senegal

Background

Senegal is one of 15 countries receiving IRS funding from the President's Malaria Initiative (PMI) that was initially launched in Fiscal Year (FY) 2006 in three countries in Africa. Since FY 2007, RTI International has been tasked by the U.S. Agency for International Development (USAID) to implement PMI and provide assistance to the Programme National de Lutte contre le Paludisme (PNLP, National Malaria Control Program) through the Senegal IRS Program. The last IRS rounds were conducted on February 25–April, 11, 2009, and May 19–August 16, 2009.

This quarterly report presents the program's progress in Senegal from January to March 2010 and summarizes the project's current activities and achievements, outstanding issues, and upcoming activities.

Current Activities and Accomplishments

This quarter was marked by preparation activities for the 2010 IRS campaign from May 3 to July 10, 2010, with the extension to three additional health districts. No spray activities were conducted in this quarter.

Planning and Assessment

During this quarter, IRS partners PNL, l'Université Cheikh Anta Diop (UCAD), Service National de l'Hygiene (SNH), PMI, and RTI met on February 16, 2010, to discuss the organization of IRS supervision. Starting with the next spray round, SNH's supervision will become more technical. The supervision of operations should include the following:

- Supervision of spray operations will involve observation of each spray team at work, based on a standard checklist.
- Supervisors at different levels will be expected to visit a given team each day, supervising the work of each spray operator on the team during each day in question.
- Completeness of supervision will be based on the checklists that are completed.
- Supervision will also require ensuring best practices for insecticide storage and solid waste management.
- Supervisors will also be expected to develop weekly reports noting strengths and weaknesses as needed and identifying operators or teams that require follow-up on the weaknesses/issues noted. These reports should also provide input on the quality of the work by team and group leaders to identify and correct problems and to assist supervisors in resolving weaknesses/problems found.
- Since the reports of the operators are the basis for all reporting and data collection, supervisors should ensure that they are completed accurately and promptly at the end of the spraying day.
- Supervision will also focus on how well the team and group leaders are synthesizing the operators' data forms.

- Supervisors must attend coordination meetings held at their level of operations (sector vs. district). At these meetings, problems with spray operator technique; methods to sensitize communities on spray schedules; and how to delivery of key information, education, and communication (IEC) messages after spraying will be discussed and corrective actions determined.
- Regional/national supervisory staff will alternate in providing continuous coverage in a district. The regional/national staff will ensure district-level coordination of supervision, attend district-level meetings, visit each of the sector supervisors at some point during the week to observe their work, provide direct supervision to the spray operators along with the sector supervisor, and help the District Health Management Team and RTI district staff to ensure good coordination and technical implementation of IRS activities in the district.

On March 3, 2010, IRS partners from PMI (Dr. Robert Perry), PNLP (Dr. Abdoulaye Diop), UCAD (Pr. Ousmane Faye), SNH (Major Mamoudou Wade), and RTI (Chief of Party [COP] Amadou Gueye) met at the RTI office to discuss IRS data collection. During this meeting, the participants discussed electronic data tracking and agreed that this new collection system would be combined with the previous one. The informal committee is comprised of PMI, PNLP, UCAD, and RTI, and is responsible for initiating the system. Dr. Perry of PMI and the RTI COP, Mr. Amadou Gueye, will coordinate the two systems.

As part of early IRS planning activities, the COP took part in the microplanning workshops in Velingara, Kooumpentoum, Malem Hodar, Guinguineo, and Nioro health districts from March 22–28, 2010, in the company of PNLP IRS focal point Dr. Diop and the PMI representative Dr. Matar Camara.

Procurement and Logistics

To prepare for the 2010 round of IRS, an IRS center validation committee visited all health districts that will be benefiting IRS this year to validate the selected IRS centers. The validation committee consisted of representatives from the Directorate of Plant Protection (DPV), the heads of districts' Hygiene Sub-brigades, Regional Environmental Services (covering health districts), the RTI environmental officer, and one member of the RTI support staff.

In the health district of Velingara, the new sites have been selected, namely Kounkane, Linkering (replacing Kalifourou and covering the rural communities of Bonconto, Kalifourou, and Linkering), Medina Gounass, Nemataba (replacing Sintiang Coundara and covering the rural communities of Nemataba and Sintiang Coundara), and Pakour.

In Nioro, four existing sites have been renewed: namely the centers of Kaymor, Médina Sabakh, Nioro commune, and Wack Ngouna. Four new sites were visited and selected as IRS centers: Keur Maba, Keur Madiabel, Paoskoto, and Taïba Niassène. The validation committee recommended building a locker room in Paoskoto and eight additional bathing areas for the four new sites (two bathing areas per site).

In each selected IRS site, the committee identified an area for the soak pit and allocated spaces for other structures (e.g., ICON room, solid waste room, materials room, locker room, sector managers' and team leaders' office, and toilet).

IRS local and international procurement processes are underway. Processes to rent vehicles and warehouse space are also underway.

Environmental Compliance

As part of environmental compliance, an RTI Environmental Officer was in Louga to finalize the incineration process for the 2007, 2008, and 2009 IRS contaminated solid waste in collaboration with the Direction de l'Environnement et des Etablissements Classés (DEEC, Environment and Classified Factories Directorate) of the Ministry of Environment.

The incineration's financial and technical results were validated by the various parties. Based on those results, they recommended the reinforcement of the incinerator's technical capabilities (by increasing the chimney's height and ensuring the availability of spare parts).

In the quest for find additional facilities to dispose of IRS solid waste, the RTI Environmental Officer visited the incinerator of Kolda Regional Hospital Center (type SH 35, monobloc appliance purchased in November 2001). The walls, the vault, the fire pit screen, and the post-combustion chamber of this incinerator are made of refractory concrete and 100mm-thick walls that are likely to bear up to 1,250°C temperature in nonstop service and that are thermal-shock resistant. In spite of its sophistication, however, the incinerator lacks a smokestack filter and first-degree emergency spare parts, and needs maintenance. To get the approval from the DEEC to use this incinerator to dispose of contaminated IRS solid waste, the hospital's technical support center and expertise need to be reinforced.

Information, Education, and Communication

The COP attended the ChildFund's IEC tools sharing and validation workshop held in Kaolack on February 22–23, 2010. The workshop was also attended by other IRS partners including PNL; PMI; SNH; ChildFund; Community Health Project in the districts; District Medical Officers from Hodar, Guinguineo, Koumpentoum, Malem, Nioro, and Richard-Toll; and Regional Medical Officers from Kaffrine, Kaolack, Kolda, Saint-Louis, and Tambacounda. During this workshop, the IEC tools drafted by the consortium responsible for the IRS IEC component, PNL, SNH, and RTI were validated by the participants.

Spray Operations

No IRS operations were undertaken in this quarter.

Other Activities

The COP and the Contracting Officer's Technical Representative worked on the auditors' questions for the 2008 IRS data audit. They clarified the difference between village and health post, particularly when the village and the health post had the same name, resulting in some 2008 IRS data being reprocessed. Dr. Perry from PMI reprocessed some of the data.

Entomological Monitoring

After three months, the insecticide on the sprayed walls was still effective in the majority of walls, indicated by the high post-exposure rate, the low densities at rest, and a majority of sprayed rooms without any female *An. gambiae s.l.* However, the spraying quality seems to be low three months down the line in the health district of Nioro, indicated by a 50% mortality rate of exposed specimens, a high variation in efficacy inside the room on the four

sections of walls and a higher than average density at rest, as well as a higher proportion of rooms providing a habitat for female *An. gambiae s.l.* The indicators show that there was a slight decline in the efficacy of the second year of IRS in the district of Nioro: these are attributable to the technical quality of the spraying and supervision.

Capacity Building of Ministry of Health

From January 18–23, 2010, the program held a training session during the IRS Planning Workshop in Thies, 70 km from Dakar. This training involved 40 participants from all districts and regions where IRS activities will be conducted in 2010—Guinguineo, Koumpentoum, Malem Hodar, Nioro, Richard-Toll, and Velingara, and also at the central location. Participants were organized into two training sessions of three days each. The first training session (January 18–20, 2010) was for participants from the regions of Kolda and Tambacounda, where the districts of Velingara and Koumpentoum are located. The second training session (January 21–23, 2010) was designed for participants from the regions of Kaffrine, Kaolack, and Saint-Louis, where the districts of Guinguineo, Malem Hodar, Nioro, and Richard-Toll are located. The workshop was conducted by facilitators such as Pr. Ousmane Faye from UCAD, Dr. Lassana Konaté from UCAD, Dr. Abdoulaye Diop from PNL, Dr. Ngayo Sy from Service de Lutte Anti-Parasitaire (SLAP, Pesticide Control Service), Major Mamoudou Wade from SNH, Mr. Ousmane Boye from DPV, and Mr. Ibrahima Toure/ChildFund and RTI representatives (COP and environmental officer). The following training content was delivered: Generalities on IRS, geographical reconnaissance and estimation of sprayable areas, quantification of insecticides, logistics needs assessment, IRS environmental management planning, and IEC implementation plan. Participants were mainly agents from SNH, districts' environmental service, agriculturalists, and one representative from the DEEC. Dr. Ellen Dotson and Dr. Matar Camara represented PMI in this workshop.

After the IRS planning workshop, the 2010 spray round trainers' training was conducted from March 4–19, 2010, and was organized into three sessions. Session 1 provided scaled up training for former trainers who had already taken part in previous IRS training. Sessions 2 and 3 were tailored for newcomers mainly from the new regions hosting the districts that will benefit from IRS in 2010. The majority of trainees for all the sessions came from SNH, while others were from the DEEC. The training was facilitated by Pr. Ousmane Faye from UCAD, Dr. Diop Abdoulaye from PNL, Major Mamoudou Wade from SNH, and Mr. Ousmane Boye from DPV.

The newly recruited IRS field office staff also took part in the training workshop. They attended sessions where trainers presented the national malaria policy and strategic framework; an introduction to IRS; and a discussion of procedures and policies involving management, environmental protection, roles of supervisors, and IRS data collection forms.

District field staff attended training sessions that revolved around the roles and responsibilities of RTI staff, coordination of IRS activities, time charts, progression plans, and finance.

PMI Advisor Dr. Robert Perry delivered a training session on using Microsoft Access software to IRS program staff, such as data clerks and finance assistants, the program

assistant, and the finance manager. The COP and the PNLP IRS focal point also took part in this training.

PMI and PNLP were also represented in this workshop by Dr. Matar Camara and Dr. Moussa Thior, PNLP's coordinator, respectively.

At the end of the session, participants received training awards following the closing ceremony.

Monitoring and Evaluation

Although it was previously planned for December 2009, Senegal's 2009 IRS Evaluation workshop was not held until January 26, 2010, at the World Health Organization (WHO) Conference room in Dakar. The workshop was chaired by Dr. Matar Camara from PMI and attended by the Technical Advisor #2 of the Ministry of Health; Dr. Thior, Pr. Ousmane Faye from UCAD; Dr. Robert Perry from PMI; representatives from RTI and ChildFund Consortium; and all IRS partners at the central, regional, and district levels. Workshop presentations were conducted by key partners such as UCAD (Entomological Monitoring), SNH (Supervision), ChildFund (IEC), and RTI (Spray Operations). The various presentations were followed by discussions. The following recommendations were made:

For supervision, spraying techniques have, on the whole, been well implemented, according to the SNH; however, some IEC issues were reported in the district of Velingara.

The following recommendations were provided for IEC:

- Involve more village leaders, women's groups, and sociocultural associations in IEC activities to solve issues related to preparing rooms prior to the arrival of spray teams.
- Involve more hygiene service agents to manage refusal cases, particularly those who are assigned to health posts areas.
- Reinforce the strategy of managing persistent rumors on insecticide efficacy, toxicity, and adverse effects through mass and community-based IEC involving health workers, hygiene service agents, and community leaders.

In order to improve spray operators' protection, participants at the 2009 IRS evaluation workshop recommended that a supply of larger gloves and neck covers be provided.

Dr. Camara from PMI also provided recommendations as follows:

- Increasing collaboration of IRS implementing teams with community-based organizations and district management teams
- Reviewing the quality of the collected data
- Conducting a selection of spray operators that is adapted to the local context
- Improving the spray operators' training
- Improving the supervision of spray operators
- Improving supervision quality
- Improving the IEC with more involvement of the community
- Reviewing IEC messages.

Structured Sprayed and Coverage

There are no available data on structures sprayed and coverage because there was no spraying activity during this quarter.

People Trained to Deliver IRS

There are no available data on people trained to deliver IRS because there was no spray operator training (SOT) activity.

Project Management and Administration

In February 2010, RTI's IRS team recruited district field staff. The selection committee consisted of the COP, logistics manager, finance manager, environmental officer, and program assistant. More than 600 applications were received by e-mail and by post. After pre-screening, the following were short listed: seven candidates for coordinators, eight candidates for finance assistants, eight candidates for logistics assistants, eight candidates for data clerks, and eight candidates for environmental assistants. After interviewing candidates, RTI recruited five staff (a coordinator, finance assistant, logistics assistant, data clerk, and environmental assistant) for its field offices in each of the six health districts that will be benefiting from IRS. Among the recruits who have not worked with the IRS program before are two new coordinators, four new finance assistants, four new logistics assistants, and four new data clerks. All six environmental assistants have not previously worked with the IRS program. Among the new coordinators, three were former environmental assistants in previous IRS rounds. The recruitment was conducted following job advertisements in the newspapers. About 30 applications have been received for the M&E technical specialist position and the recruitment will be conducted soon.

An RTI home office financial team delivered training on QuickBooks® software to all RTI finance staff in Senegal. The training

- Delivered the accounting software (QuickBooks®) to the IRS project
- Provide training to the financial manager on the use of the accounting system and provided hands-on training on making transactions
- Deliver an updated financial manual

Tito Kodiaga, IRS Senior Environmental Compliance Manager from the Nairobi Regional Office, was in Senegal from February 10–21, 2010, to amend the existing Pesticide Evaluation Report and Safe Use Action Plan to include all the possible districts in Senegal that are likely to qualify for future IRS. To produce a revised Supplemental Environmental Assessment for the IRS program, Mr. Kodiaga met with relevant partners, including PMI/USAID, PNLP, and the Department of Environment. He also collected baseline environmental information about the additional districts, including identifying sensitive ecosystems. At the end of his trip, Mr. Kodiaga held a debriefing with PMI/USAID, PNLP, Department of Environment, and other partners.

Partnership and Collaboration

The COP took part in the USAID's synergy meeting on January 12, 2010, with PMI and other partners. During this meeting, a new USAID program entitled Agriculture and Food Security was presented to the attendees.

RTI's IRS COP visited Guinguineo, Koumpentoum, and Malem Hodar to meet the respective health authorities in those areas. He was accompanied by Dr. Diop from PNLN. They discussed IRS planning and objectives with regional and district health officers. The PNLN, the District Health Officers, and RTI agreed on a revised Senegal implementation plan and timeline. The dates for all the activities and the responsibilities for the activities were determined.

The COP also met with Pr. Faye from UCAD and Dr. Diop from PNLN on February 3, 2010, to discuss IRS partners' steering committee set-up. The steering committee will be officially established by the Ministry of Health, with specific terms of reference. The committee will operate as a discussion framework to coordinate investigation of and integration in the vector control activities of other possible vector-borne disease programs. The steering committee will, in particular, support current IRS implementation and monitoring as part of the PMI and will support the various vector control programs/interventions and ensure that all stakeholders' activities comply with country orientations and guidelines. The national steering committee will manage intersectoral issues such as policies and regulations on pesticides including the Stockholm Convention on persistent organic pollutants. A small technical committee will be set up within the national malaria control steering committee. This technical committee will be formed by representatives of partners involved in vector control intervention planning, implementation, and monitoring and evaluation. It will manage any strategic and operational issues that the PNLN will be facing as part of vector control management, such as capacity building, supervision, research, and monitoring and evaluation.

The steering committee comprises the following members:

1. Ministry of Health and Prevention
2. Ministry of Agriculture
3. Ministry of Environment
4. Ministry of Interior
5. Ministry of Infrastructure, Equipment and Transports
6. Ministry of Urban Planning and Land Use Planning
7. UCAD
8. Ecological Monitoring Center
9. RTI International
10. Development Research Institute
11. Institut Pasteur of Dakar
12. WHO
13. USAID
14. United Nations Children's Fund
15. Nongovernmental organizations (e.g., ChildFund, Plan International, World Vision, Red Cross, etc)

The draft to establish this steering committee was prepared by Pr. Faye from UCAD and submitted to PNLN's coordinator in mid-March 2010.

The COP took part in the PNLP workshop to review the progress in implementing malaria control activities with partners. The workshop was held on February 11, 2010, in partnership with the PMI and was attended by all IRS partners at central, regional, and district levels.

To mitigate the risks of financial management at the field level, the COP and the finance manager met with the Dakar Post Office Financial Center's manager to discuss methods to pay IRS seasonal staff in the districts. The post office manager confirmed the existence of post offices in each of the various districts that would receive IRS. RTI will establish a transfer order and fax the payment statements for all workers in each district to each post office. The post office will make the money available within four days after the transfer order is received. RTI will provide the post office with additional information on each districts' seasonal personnel during the payment process. Each local RTI finance assistant will be at the post office during paydays to collect the payees' signatures. The post office will determine the maximum number of persons who can be paid per day. In the following meeting, both parties agreed to establish a Memorandum of Understanding about paying IRS seasonal staff at the district level.

Outstanding Activities

- Recruit the M&E technical specialist

Upcoming Activities, April–June 2010

- Conduct IRS operations from May 10 to July 10, 2010

Zambia

Background

This quarterly report presents the Indoor Residual Spraying (IRS 2) project's progress and achievements in Zambia from January 1 to March 31, 2010. This report also highlights postspray activities, outstanding issues, and upcoming activities. During this reporting period, the project focused on completing the postspray environmental compliance inspection in the target districts, participating in the needs assessment of the 53 districts targeted for IRS in 2010, collecting dichloro-diphenyl-trichloroethane (DDT) waste from the districts, and coordinating and preparing the Zambia Bureau of Standards (ZABS) laboratory to analyze soil and crop samples during the next quarter.

The RTI team hosted a postspray meeting in February 2010 to review the achievements of the 2009 spray round and share findings of the postspray environmental compliance inspections. Representatives from all 36 targeted IRS districts in Zambia attended the meeting. During the meeting, the Acting Coordinator for the National Malaria Control Center (NMCC), Dr. Kamuliwo, announced that the IRS program would be expanded to 18 new districts¹—bringing the total number of districts in Zambia targeted for IRS to 54. The NMCC also announced that the United States President's Malaria Initiative (PMI) will support procurement of insecticides and personal protective equipment (PPE) to all the 54 IRS districts in Zambia in 2010. In April, the number of target districts was reduced to 53 when PMI and NMCC decided to omit Lusaka district because, after many rounds of IRS in Lusaka, entomological data show that the malaria burden is now relatively low.

Current Activities and Accomplishments

Planning and Assessment

During the quarter, the NMCC coordinated and led an IRS needs assessment in all 53 districts. As part of the exercise, three teams of people were tasked with conducting the assessment in 18 districts each in 2 weeks. However, the assessment was delayed because the additional districts were unable to provide all the required data and quantifications for PPE and insecticide, which required multiple follow-up visits to collect missing data. A comprehensive needs assessment report was prepared and shared with the Health Services and Systems Program (HSSP), PMI, and RTI.

The IRS Working Group convened immediately after the postspray meeting to develop an action plan for the in-stock DDT sachets set to expire in July 2010. The group agreed that the DDT should not be used in the upcoming 2010 IRS campaign scheduled to launch in September, but rather should be used for a mop-up exercise before July 2010 to ensure that it is used before it expires. The following districts were selected for mop-up activities: Luanshya, Mazabuka, Kazungula, Ndola, Mufurila, Chhingola, and Solwezi.

¹ The new districts are Chadiza, Kundazi, Chama, Gwembe, Sinazongwe, Sesheke, Iezhi-Tezhi, Kalabo, Kabompo, Mwinilunga, Chibombo, Chiengi, Samfya, Mwense, Isoka, Mpulungu, Luangwa, and Chinsali.

RTI and PMI held regular conference calls to share of information and resolve operational challenges. The calls focused on completing the work plan and quantifying the insecticides and PPEs.

Procurement and Logistics

The three teams organized by NMCC and supported by RTI conducted the needs assessment of all 53 districts and made follow-up visits to the new districts. Afterward, the teams compiled a report that detailed insecticides and PPEs requirements for the IRS target districts. Information from the report was used to update the 2010 budget and work plan to more accurately reflect the current needs. In so doing, RTI was able to develop a task order with its procurement partner, Crown Agents-USA, to begin procurement in early April, well in advance of the start of the spray campaign.

Environmental Compliance

Strategic Environmental Assessment

During the reporting period, we circulated the Strategic Environmental Assessment draft document to the National Core Team for comments. The workshop to incorporate comments from the National Core Team will be held next quarter, and then circulated to the relevant districts for additional comments. The Strategic Environmental Assessment will provide the framework under which IRS will be conducted in Zambia.

The annual revision of the Supplemental Environmental Assessment that PMI uses to approve DDT insecticide procurement has been postponed until April 2010 because the Regional Environmental Specialist based in Nairobi cannot travel to Lusaka until late April.

Postspray Environmental Compliance Inspection

Autman Tembo, the RTI Environmental Compliance Officer based in Nairobi, conducted the postspray environmental compliance inspection in January 2010. The inspection focused on exploring options for next steps with the remaining insecticide stocks, including DDT sachets that were near their expiration date and inspection of the spray pumps and storerooms.

Table 1 below shows the number of sachets remaining in each district and their corresponding expiration dates.

Table 1. Remaining DDT sachets and expiration date

District	Number of Remaining DDT Sachets	Expiration Date	Quantity of
Livingstone	305	December 2009	241.5 kg
Mufulira	30	December 2009	85 kg
Ndola	1,953	June 2010	133.6 kg
Kalulushi	155	June 2010	187.7 kg
Chililabombwe	40	June 2010	200 kg
Chingola	660	June 2010	85 kg
Solwezi	1,000	June 2010	5 kg
Luanshya	0		1261.65 kg
Kitwe	0		85 kg
Kazungula	0		46.8 kg
Kafue	0		500 kg

District	Number of Remaining DDT Sachets	Expiration Date	Quantity of DDT Contaminated Waste on Site
Lusaka	0		1,000 kg
Chongwe	0		187.75 kg
Kabwe	0		135 kg
Mazubuka	0		150 kg
TOTAL	4,143		4,043 kg

DDT Monitoring

PMI, the NMCC, and RTI worked with the ZABS laboratory to ensure that their gas chromatography-mass spectrometry (GC-MS) laboratory analysis equipment is prepared to analyze crop and soil samples for DDT residues. Dr. Bill Studabaker, an experienced environmental scientist based at RTI's home office in North Carolina, will travel to Lusaka in April to ensure the GC-MS equipment is operating properly in order to run the crop and soil samples and general quality results; and he will also train the laboratory staff to conduct the analysis. Dr. Studabaker is coordinating with RTI procurement staff to obtain the supplies and solvents required for operating the GC-MS equipment that cannot be purchased locally in Zambia.

DDT Waste Disposal

Crown Agents-USA delivered the 40-foot metal container to the Lusaka City Council Maintenance Yard in January 2010. The RTI team worked with NMCC to weigh and collect the DDT waste from the districts. A total of 2,945.4 kg DDT was collected and is stored in the containers (Figure 1) awaiting repatriation by Avima. In the future, Avima will collect all DDT-contaminated waste from the Lusaka City Council Maintenance Yard.



Figure 1: Empty sachet storage at two different storerooms.

Information, Education, and Communication (IEC)

Although RTI is not directly involved with IEC activities related to IRS in Zambia, the Program Manager attended the postspray meeting in February. At the meeting, the participants reviewed the most effective ways of sharing information with the beneficiaries of IRS activities.

Spray Operations

The needs assessment conducted during the period under review resulted in quantification of insecticides and PPEs required for the next spray round. The government of Zambia has expanded the IRS program from 36 to 53 districts and PMI has agreed to finance procurement of both insecticide and PPE in all 53 districts. As stated above, Crown Agents-USA has already begun the procurement process.

Other Activities

Entomological Monitoring

Entomological monitoring is not part of RTI's scope of work in Zambia; this activity is conducted by other NMCC stakeholders.

Capacity Building of Ministry of Health

As mentioned above, RTI plans to train three staff from ZABS, one from the University of Zambia, and one from the Food and Drug Laboratories to analyze crop and soil samples for DDT residues at the ZABS laboratory in Lusaka.

Two stakeholders will also be trained in environmental compliance inspections next quarter at a regional workshop organized by the Environmental Management and Capacity Building project.

Monitoring and Evaluation

The NMCC and HSSP released the results from the 2009 IRS season. The data show the number of formal and informal structures sprayed by district with the resulting coverage by district. These results were used to guide planning, budgeting, and procurement for the 2010 IRS season. **Table 2** shows the 2009 IRS results for the 36 target districts in Zambia.

Table 2. Structured Sprayed and Coverage by District

District	Number of Structures Targeted in 2009	Number of Structures Sprayed in 2009			Coverage (%)
		Formal	Informal	Total	
Kabwe	44,000	22,828	17,165	39,993	90.9
Chililabombwe	13,900	9,351	3,823	13,174	94.8
Kalulushi	17,000	7,799	8,110	15,909	93.6
Luanshya	25,500	17,820	5,579	23,399	91.8
Mufulira	33,804	21,424	9,540	30,964	91.6
Ndola	72,542	48,980	17,758	66,738	92.0
Chingola	31,679	21,501	6,142	27,643	87.3
Kitwe	70,000	50,526	14,453	64,979	92.8
Chongwe	40,215	31,486	4,240	35,726	88.8
Kafue	33,106	15,654	15,450	31,104	94.0
Lusaka	388,168	276,618	70,347	346,965	89.4
Kazungula	25,000	1,063	18,432	19,495	78.0
Livingstone	24,600	15,190	7,365	22,555	91.7
Mazabuka	21,000	15,640	5,191	20,831	99.2
Solwezi	21,000	6,840	12,865	19,705	93.8
Kapiri-Mposhi	20,000	5,452	10,894	16,346	81.7
Mumbwa	22,495	5,008	15,944	20,952	93.1
Lufwanyama	13,784	1,117	10,748	11,865	86.1
Masaiti	20,581	3,915	14,344	18,259	88.7

District	Number of Structures Targeted in 2009	Number of Structures Sprayed in 2009			Coverage (%)
		Formal	Informal	Total	
Mpongwe	19,500	1,645	16,401	18,046	92.5
Chipata	45,000	10,748	32,305	43,053	95.7
Katete	25,000	7,621	17,300	24,921	99.7
Petauke	40,000	14,186	22,302	36,488	91.2
Nchelenge	28,000	2,509	25,095	27,604	98.6
Kawambwa	12,000	2,211	8,871	11,082	92.4
Mansa	23,000	4,426	20,155	24,581	106.9
Chilubi	17,000	165	15,161	15,326	90.2
Kasama	24,000	12,260	6,665	18,925	78.9
Mbala	20,000	4,704	12,068	16,772	83.9
Mpika	10,000	3,922	4,455	8,377	83.8
Choma	18,905	7,236	9,921	17,157	90.8
Monze	12,000	4,011	5,989	10,000	83.3
Kaoma	32,662	5,111	25,498	30,609	93.7
Senanga	12,000	887	8763	9650	80.4
Mongu	26,500	8,045	16,117	24162	91.2
Kasempa	10,000	1,210	6,952	8,162	81.6
Total	1,313,941	669,109	522,408	1,191,517	90.8

Project Management and Administration

Autman Tembo visited Zambia in January and February 2010. He first came to conduct the postspray environmental compliance inspection, and then returned in February 2010 to participate in the postspray meeting, where he shared the findings of the postspray environmental compliance inspection with stakeholders.

Partnership and Collaboration

RTI participated in the IRS Working Group meeting that was held immediately after the postspray meeting. The purpose of the meeting was to make decisions and develop a plan of action for the in-stock DDT set to expire in July 2010. It was agreed that a mop-up of the spray operation will be conducted to some districts so that the DDT could be used before it expires.

Outstanding Activities

- The DDT analysis with ZABS did not take place because the GC-MS equipment was not fully installed and the ZABS staff did not have the technical capacity to analyze the DDT.

Upcoming Activities

- Conduct DDT analysis training for ZABS staff to analyze DDT samples
- Conduct postspray DDT monitoring sample collection
- Relocate to new office