



Final Project Report

February 20, 2010– April 31, 2012

Community Livelihoods and Economic Assistance through
Rubble Removal and Shelter (**CLEARs**); Haiti
Neighborhood Rebuilding Program (**Katye**); Clearing Land
to Provide Accessible Neighborhoods (**CLEAN**)



Contents

Introduction: USAID/OFDA-funded CLEARs Programs	5
Community Livelihoods and Economic Assistance through Rubble Removal and Shelter (CLEARs 1)	7
Tools and Methods.....	7
Beneficiaries	8
Program Description by Sector	8
Sector: Economic Recovery and Market Systems (ERMS).....	8
Sub-Sector: Market Infrastructure Rehabilitation	8
Sub-Sector: Temporary Employment	10
Sector: Shelter and Settlements (S&S).....	13
Sub-Sector: Emergency/Transitional Shelter.....	13
Sector: Water, Sanitation, and Hygiene (WASH)	19
Sub-Sector: Sanitation.....	19
Haiti Neighborhood Rebuilding Program (Katye)	24
Summary of Demonstrated Impact.....	24
Tools and Methods.....	26
Beneficiaries.....	27
Program Description by Sector	27
Sector: Shelter and Settlements.....	27
Sub-Sector: Emergency/Transitional Shelter.....	28
Sub-Sector: Shelter Hazard Mitigation	33
Sector: Water, Sanitation and Hygiene	35
Sub Sector: Sanitation.....	36
Sub-Sector: Hygiene Promotion	37
Sub-Sector: Water Supply	39
Sector: Protection.....	43
Sub sector: Child Protection	43
Sector: Health Systems and General Health.....	48
Clearing Land to Provide Accessible Neighborhoods (CLEAN) Program	55
Tools and Methods.....	55
Beneficiaries	56
Program Description by Sector	56
Sector: Shelter and Settlements (S&S).....	56
Sub-Sector: Emergency/Transitional Shelter.....	56
Program Description by Geographic Area.....	63
Turgeau.....	63
Carrefour	64
Delmas 32	65
Other: Delmas / Solino	65
Tabarre.....	65
Supplemental Materials	66

Acronyms & Abbreviations

ACTED	Agency for Technical Cooperation and Development
BBC	British Broadcasting Corporation
CAMEP	Centrale Autonome Métropolitaine d'Eau Potable
CBO	Community Based Organization
CFP	Cash For Production
CFS	Child Friendly Space
CFP	Cash For Production
CFW	Cash For Work
CHF	Cooperative Housing Foundation
CHW	Community Health Worker
CIAT	Comité Interministériel d'Aménagement du Territoire
CLEAN	Clearing Land to Provide Accessible Neighborhoods
CLEARs	Community Livelihoods and Economic Assistance through Rubble Removal and Shelter
CNE	Centre National d'Equipment
CRS	Catholic Relief Services
CRUSH	Creating Rubble Recycling Solutions for Haiti
CTC	Cholera Treatment Center
CTE	Centre Technique d'Exploitation
DGI	Direction General des Impôts
DINEPA	Direction Nationale de l'Eau Potable et de l'Assainissement
DRR	Disaster Risk Reduction
DRRS	Demolition and Rubble Removal Strategy
ERMS	Economic Recovery and Market Systems
FOG	Field Operation Guide
GOH	Government of Haiti
GPS	Global Positioning System
HFA	Host Family Assistance
HFH	Habitat for Humanity
IDP	Internally Displaced Person
J/P HRO	J/P Haitian Relief Organization
KATA	
KCC	Katye Central Committee
KMZ	Keyhole Markup Zipped
M&E	Monitoring and Evaluation
MNCH	Maternal, Neonatal, Child Health
MoH	Ministry of Health
MPC	Multipurpose Cadastre

MSPP	Ministère de la Santé Publique et de la Population
MTPTC	Ministère des Travaux Publics, Transports & Communications
NIF	Numéro d'Identification Fiscal
OFDA	Office of Foreign Disaster Assistance
ORS	Oral Rehydration Solution
PADF	Pan American Development Foundation
PCI	Project Concern International
PHAST	Participatory Hygiene and Sanitation Transformation
RIG	Regional Inspector General
S&S	Shelter and Settlements
SHERE	
SMCRS	Solid Waste Collect Metropolitan Services
SME	Small Micro-enterprises
UNOPS	United Nations Office for Project Services
USAID	United States Agency International Development
VIP	Ventilated Improved Pit
WASH	Water, Sanitation and Hygiene

Introduction: USAID/OFDA-funded CLEARs Programs

On January 12th 2010, a devastating 7.0 magnitude earthquake struck Haiti resulting in the loss of more than 230,000 lives and massive destruction. CHF responded immediately. With funding from USAID/OFDA, CHF launched a major recovery program that focused on large-scale rubble removal and recycling, cash-for-work, construction of transitional shelters and a new type of disaster response using a neighborhood approach.

The following report documents relief and recovery efforts undertaken by CHF and partners during the first 27 months after the earthquake, February 2010 to April 2012. This report begins with documentation of the USAID/OFDA-funded Community Livelihoods and Economic Assistance through Rubble Removal and Shelter (CLEARs) program under Agreement No. CHF DFD-G-00-10-0103-00. Begun weeks after the earthquake, CHF's CLEARs program focused on creating an environment for economic, social, and political recovery through the removal of debris and the construction of disaster resistant transitional shelters with appropriate water and sanitation facilities. The original agreement covered the period of February 20 to October 20, 2010. The agreement was amended on several occasions. On November 9, 2010 the Agreement was modified to add "Haiti Neighborhood Rebuilding Program (Katye)." The Agreement was modified again on February 11, 2011 to add the "Clearing Land to Provide Accessible Neighborhoods Program (CLEAN). As a result, the CLEARs agreement is an amalgamation of 3 programs: CLEARs 1, Katye, and CLEAN. All activities concluded on April 30, 2012. The following report documents the three programs in order of the date the agreements were signed.

While implemented under the same agreement, the projects were distinct. CLEARs 1 focused on providing immediate relief and assistance to displaced persons and host families through the provision of transitional shelters, alternative shelter solutions, and sanitation facilities. The CLEAN project enabled continued relief and recovery through debris removal and temporary employment. Under CLEAN, OFDA encouraged CHF to link rubble removal with shelter recovery to enable in situ reconstruction and facilitate IDP returns from camps to neighborhoods. Katye built upon CLEARs 1 and CLEAN. The Katye program grew from recognition by OFDA that a more integrated approach was needed to truly ensure returns to damaged neighborhoods; the complexity and severity of the damage in Haiti meant that shelter projects such as CLEARs 1 and CLEAN were necessary but not sufficient. Katye was an integrated neighborhood approach to rehabilitation developed by OFDA, CHF and partner organization PCI, based on the experience of each organization in Haiti and other disasters. Many of the project components from CLEARs 1 and CLEAN were adopted within the broader, multisectoral framework of the Katye project.

Thanks to the support and flexibility of OFDA, these emergency projects have enabled CHF to partner with Haitian communities across Haiti to help them recover from the devastating effects of the disaster and the challenges they have faced since then. Through the CLEARs 1, Katye and CLEAN projects, OFDA/CHF accomplishments include:

- **Built 4,830 transitional shelters**, housing over 24,150 Haitians in sanitary, safe conditions.
- **Demolished 1,119 houses** and other sites including 134 schools, 18 government and public buildings, 8 churches, 18 commercial areas, 3 hospitals/clinics, and 140 streets.
- **Removed 542,764 cubic meters of rubble and debris** enabling affected families and shelter partners to begin rebuilding damaged neighborhoods.
- **Employed 20,715 Haitians** in Cash for Work (CFW) and Cash for Production (CFP) programs providing livelihood support and economic stimulus to affected families.
- **Constructed 3,320 latrines/toilets and educated 144,626 people on cholera prevention** and treatment.
- Developed and implemented a **community-based, neighborhood reconstruction project** that has served as a model for response to urban disasters.

Through these activities and others that are documented in this report, USAID/CLEARs **benefitted nearly 90,000 earthquake affected people.**

The impact of these projects extended beyond the direct beneficiaries of any of the projects. Throughout the Haiti response, with the support of OFDA, CHF has acted as a leader among shelter partners. Capitalizing on strong networks developed before the earthquake, CHF quickly gathered and shared needs assessments during the first few days of the relief effort. Over the subsequent 27 months, CHF has continued to innovate and lead. New approaches to urban disaster response were piloted in each of the three programs. Results were shared through cluster meetings, international conferences, local and national press events, and meetings with key stakeholders. Innovative initiatives and systems of documentation developed by CHF, its partners, and OFDA, during these three programs have since informed the activities of many partners involved in the large, urban response.


The IDP/Host Family Assistance activity is an example of the innovation characteristic of CHF's Haiti OFDA-funded earthquake response. In addition to providing emergency and transitional shelters to thousands of displaced persons, the CLEARs 1 project offered a solution to ensure that the needs of disaster affected persons (IDPs) who left Port-au-Prince would be met. The Host Family Assistance (HFA) provided a menu of vouchers including small business grants, school fees, school supplies, household supplies, and work tools to IDPs and their host families in Cap Haitien. This basic support ensured that hosting did not strain relations or host families' pocketbooks, while also facilitated its role as a shelter solution. The CLEARs 1 project provided further evidence that hosting by family and friends is a culturally appropriate solution to displacement that can be provided faster than other shelter solutions and—importantly—is sustained long after humanitarians leave. The results of the innovative HFA developed under CLEARs 1 with OFDA funding were shared with OFDA and other shelter partners and have since informed the activities of many other programs. Following CLEARs 1, CHF continued implementing the HFA model in the North Department through a DAI/OTI funded HFA program. Adoption of the model by other NGO and donor organizations illustrates the continued impact of the innovations funded by OFDA.

OFDA's support for the return of internally displaced persons (IDPs) through clearing of neighborhoods to enable shelter construction is another example of flexibility and innovation. Under CHF's OFDA-funded CLEAN program, more than 240,000 m³ of rubble was cleared from Port-au-Prince neighborhoods. Public spaces, infrastructure and other high density buildings were cleared first. OFDA was one of the only donors to recognize that in a dense urban setting where land scarcity created vulnerability even before the earthquake, rubble had to be cleared to enable shelter recovery. The CLEAN project partnered rubble removal and transitional shelter planning to enable more efficient shelter relief.

From the onset, OFDA took the lead in innovations relating to manual CFW and economic stimulus. In facilitating the standardization of payment and benefits for CFW by all organizations implementing CFW activities, OFDA mitigated violence and protests. OFDA also supported CHF's innovations with respect to CFW. CHF led a shift from Cash-for-Work to Cash-for-Production in Haiti by demonstrating that it is possible to create temporary jobs remunerated on outputs to ensure more efficient program implementation. Observations made at the end of CLEARs 1 were tested under CLEAN and suggested that using an output based system of payment encouraged a dramatic increase in daily productivity of rubble removal teams. The success of this approach encouraged CHF and many partners to shift to a CFP system for all kinds of manual labor, including manual demolition and rubble removal. The CFP system as well as the system of ticketing CHF developed to track and monitor rubble removed from project sites has been shared and adopted by UNDP for its Debris II demolition and rubble removal programs.

OFDA played a central role in designing the Katye model. Katye was a new and innovative approach to urban recovery. The program was subject to extensive internal and external evaluation and results were shared with both local and international stakeholders. The Katye approach provided rubble removal and shelter recovery services, while working with the community to reduce disaster risk, plan for green spaces, schools and water points, and create access roads to cover the basics of sustainable urban improvement. By targeting every aspect of urban development, while meeting the emergency needs of the community in a short time frame, the Katye program has served as a successful pilot for neighborhood-based urban disaster recovery. The model has since been the basis for other projects in Haiti as well as other Latin American urban centers.

Community Livelihoods and Economic Assistance through Rubble Removal and Shelter (CLEARS 1)



On January 12, 2010, one of the most destructive earthquakes in history struck Port-au-Prince. In response, CHF capitalized on extensive ground experience and connections to begin responding immediately. Funded by USAID/OFDA, CLEARS 1 was the first of three major endeavors CHF undertook to assist in the relief and recovery effort. Begun just one month after the earthquake, CLEARS 1 focused on immediate relief, creating an environment conducive to economic, social, and political recovery. With the support of OFDA, CHF aided nearly 60,000 disaster affected persons through the removal of debris, the construction of transitional shelters, and the provision of latrines. The activities described throughout the report enabled communities to begin rebuilding.

The direct impact of the project is profound:

- **Cleared more than 805 sites** in Leogane, Gressier, Petit Goave, Grand Goave and Port-au-Prince including 134 education institutions, 18 government and public buildings, 8 churches, and 18 commercial areas, 311 beneficiary houses, 2 hospitals and 1 clinic, and 140 streets.
- **Safely and efficiently removed 265,404 m³ of rubble** — over 13% of that cleared by all actors during the first year of the response.¹
- **Employed 20,715 disaster-affected people and disbursed a total of \$1,784,160** in direct payment of wages to persons employed. The project exceeded the planned number of total person days, reaching 356,832.
- **Provided 5,485 transitional shelter solutions** benefitting more than 28,525² individuals, including 4,935 t-shelters built in accordance with SPHERE standards. Through shelter construction activities, CHF **injected over \$3.6 million dollars into the local economy**, 40% of the shelter budget.
- **Dug 3,315 ventilated improved pit latrines and dual latrines** benefitting an estimated 16,035 individuals.
- **Provided cholera prevention and awareness training by educating 137,386 beneficiaries** in Gonaives, Port-au-Prince, Leogane, Cap Haitien and Carrefour on cholera prevention, identification and treatment at a cost to the project of \$0.18 per beneficiary.

Beyond the support to the immediate beneficiaries of the project, CHF played a role as a leader and innovator in the response. CHF spearheaded a land tenure verification process using community consensus that enabled more rapid commencement of shelter construction, an essential innovation in neighborhoods with next to no formal documentation of land rights. CHF was the first to model the hurricane resistant metal-framed transitional shelter, an alternative to the wooden and plastic structures erected by most organizations. Beneficiary selection tools, the host-family voucher model, and the extensive rubble tracking systems developed by CHF under CLEARS 1 have all been shared with other actors and adopted more broadly. The rubble tracking system is now used by UNDP. CHF participated in cluster meetings providing valuable data and information which informed the activities of municipal, local and international partners' recovery activities. In addition, CHF demonstrated cost-efficient strategies; comparison with other agencies involved in CFW, I reveals that CHF was able to remove rubble at a third of the average price per m³.

Tools and Methods

Despite the post-disaster urgency, extensive efforts were taken to monitor program activities and impact. The Regional Inspector General (RIG) audits of both USAID funded Cash-for-Work Activities in Haiti, (1-521-10-009P)

¹ UNDP estimated that 2 million cubic meters were cleared within the first year of the response.

² Figure based on an average household size of 5 for families receiving t-shelters and 7 for host family/IDP shelter recipients.

and USAID's Efforts to Provide Shelter in Haiti (1-521-11-003P), reviewed CHF activities under the CLEARS 1 project. In addition, CHF conducted three internal evaluations covering: (1) CFW, (2) transitional shelter construction, and (3) host-family assistance. These internal assessments relied on multi-method approaches—household assessments, phone surveys, focus groups, and document reviews—to objectively evaluate the impact of project activities and document lessons learned. Habitat for Humanity also evaluated satisfaction and impact of their shelters and latrines. Results of both the internal and external findings are included throughout this report.

In addition to these evaluations, ongoing monitoring of program activities was made possible using an integrated tracking system developed by CHF. Real time monitoring enabled CHF to work with OFDA to address challenges as they arose and adopt program activities accordingly. Progress was reported to OFDA on a quarterly basis.

Beneficiaries

The CLEARS 1 project benefitted earthquake affected people across Haiti, both those within the immediately affected areas of the West Department and host-communities in the North Department.³ As illustrated in the table below, the project benefitted nearly 60,000 people through economic recovery, shelter and sanitation activities.

	Original Target	Revised Target ⁴	Total Achieved	Percent Achieved
Economic Recovery and Market Systems	82,920	16,000	14,868	93%
Shelter and Settlements	34,450	27,600	27,425	99%
WASH	30,200	15,955	16,035 (4,075 unique) ⁵	100%
Total	147,570	59,555	58,328	98%

Program Description by Sector

Sector: Economic Recovery and Market Systems (ERMS)

Objective: To provide critical income earning opportunities and restore basic livelihood systems.

Sub-Sector: Market Infrastructure Rehabilitation

Indicator Table 1. Market Infrastructure Rehabilitation

	Indicator	Target	Total Achieved	Percent Achieved
Indicator 1	Amount Market Infrastructure Rehabilitated (miles of road, numbers of buildings cleared)	--	--	--
Indicator 2	Number of cash grants to Small Micro-enterprises (SMEs)	--	--	--
Indicator 3	Total USD amount of cash grants to Small Micro-enterprises (SMEs)	--	--	--
Indicator 4	Cubic meters of rubble removed	206,250 m ³	265,404 m ³	129%

³ Cholera prevention activities benefitted these areas as well as the Artibonite Department.

⁴ All targets revised based on changes in cost or programmatic aims discussed throughout the report. All changes have been previously approved by OFDA.

⁵ See WASH section for a more detailed explanation. Figure does not include beneficiaries of cholera education.

Following the earthquake, extensive rubble and debris prevented Haitians from rebuilding and resuming normal lives. Rubble filled streets blocking access to schools, hospitals and homes. Individual efforts to remove debris merely relocated it to the sides of roads or drainage canals, creating congestion and flood risk. The daily downpours during the rainy season leached toxic chemicals and carcinogens from the rubble into the storm water system and ultimately into drinking water. To support rubble removal, OFDA funded CHF to assist in the efforts.

Over the course of the project, CHF cleared more than 805 sites in Leogane, Gressier, Petit Goave, Grand Goave and Port-au-Prince were demolished and cleared. These sites include 134 academic institutions, 18 government and public buildings, eight churches, and 18 commercial areas, 311 beneficiary houses, two hospitals, one clinic, 140 streets, and from streets and houses of the Ravine Pintade neighborhood (18,000 m³). In addition, the Palais Legislatif was demolished and cleared in collaboration with the government of Haiti. Through these projects, CHF cleared 265,404 m³ of rubble. By September 2010, CHF had cleared more than 100% of the targeted amount.

The process of clearing private homes and infrastructure was done in parallel with extensive community engagement. Early on CHF experienced the consequences of uncoordinated, large scale demolitions. In Fort National, the Centre National d'Equipment (CNE) cleared rubble haphazardly, failing to leave markings of home sites. This method resulted in significant, violent land disputes as residents tried to stake claims of newly cleared land that had no clear land ownership. Despite pressure from the government, CHF did not adopt the CNE strategy. Learning from this experience, CHF ensured the following: community engagement proceeded demolition to ensure all property was accounted for prior to clearing; heavy equipment was used on large, multistory buildings but not on smaller plots where land boundaries had to be marked; and strong partnerships were established with USAID and the GOH to coordinate activities and set up community groups. This experience also informed clearing activities implemented under CLEAN and Katye.

CHF's ability to remove more rubble than targeted is noteworthy given general criticisms of the lethargic rate of rubble removal nationally. CHF brought in heavy machinery to do most of the rubble removal at large sites while relying on CFW teams to gather and crush smaller pieces of debris not picked up by the loader or excavator. In smaller spaces, such as narrow streets and drainage canals, CHF used manual labor to perform the majority of the clearing using hand tools. Of the total rubble removed, 161,286 m³ (61%) was cleared using primarily heavy machinery; the remainder was cleared manually. CHF and external evaluators, including the RIG, attribute the success of the rubble removal activities to the recognition by CHF and OFDA that investments in both CFW and heavy machinery were necessary to address the large scale problem of rubble. Using the current UNDP estimate that 10 million m³ of rubble was created by the earthquake, it is estimated that 2.7% of the total rubble generated by the earthquake was cleared under the CLEARS 1 project; and of the estimated 2 million m³ removed by all organizations during the first year of the response, 13% was cleared by CHF by the end of September 2010.

Relative to other organizations managing CFW projects, CHF rubble removal activities were more cost-effective. A comparison with other agencies involved in rubble removal reveals that CHF was able to remove rubble at a third of the average price per m³.

	Total Salaries Paid (\$)	Estimated Rubble Removed (m ³)	Dollars per m ³
IOM	2,782,687	184,319	15.1
CHF	543,565	110,000	4.9
DAI	1,248,265	108,474	11.5
Chemonics	2,695,729	78,993	34.1

Total	7,270,246	481,786	15.1
-------	-----------	---------	------

Source: RIG Audit of USAID's Cash-for-Work Activities in Haiti
Audit Report: 1-521-10-009-P; Sept 2010

Strong partnerships and smart management kept costs low. For example, the cost of leased equipment plagued all NGOs involved in rubble removal. In July, CHF switched from standard rental contracts with fees calculated on a daily basis for heavy equipment and on a cubic meter rate for dump trucks, to Task Orders with fixed price ceilings. These changes and other standard mechanisms such as competitive bidding processes kept costs down enabling greater quantities of rubble to be removed for the same price.

These successes were achieved despite significant challenges. Chief among them was the lack of environmentally appropriate dumpsites within reasonable distance from project sites which increased the time and cost of removing rubble. Two years later, there is still only one dump site in Port-au-Prince.

Sub-Sector: Temporary Employment

Indicator Table 2. Temporary Employment

	Indicator		Target	Total Achieved	Percent Achieved
Indicator 1	Number of people employed through CFW activities	People	16,000	14,868	93%
		Person-days	320,000	356,832	112%
Indicator 2	Average USD amount per person earned through CFW activities		\$100	\$120 ⁶	120%
Indicator 3	Number and percent of women employed through CFW		--	5,064	--
			40%	34%	85%

The CLEARS 1 project was designed to stimulate the economy by creating 16,000 short-term jobs for beneficiaries as a means of alleviating the hardship conditions created by the disaster, enable them to access basic living needs by providing them with an opportunity to sustain their livelihood, encourage communities to carry out the demolition, clearing and cleaning of debris left behind by the earthquake and facilitate economic stability by infusing cash into the local economy as a means of revitalizing it after the disaster. Cash-for-Work teams were involved in manually clearing roads, demolishing houses and public buildings such as schools and hospitals as well as cleaning canals to avoid flooding and infestation from stagnant waters.

Through rubble removal and other recovery efforts, the CLEARS 1 project employed 14,868 disaster-affected people and disbursed a total of \$1.7 million in direct payment of wages. The project exceeded the planned number of total person days, reaching 356,832.

The CFW system implemented by CHF under CLEARS 1 followed standard operating procedures developed by CHF and other members of the OFDA-led CFW working group. These procedures dictated standards such as wages, hours per day and number of people per team, and were designed to correspond with government priorities. CHF CFW was informed by experience in Fort National, a very hot and hostile environment, where aggressive demolition done without strong community partners resulted in violence and protests. To ensure that the CFW benefitted the local economy and contributed to stability and rebuilding, CHF worked with the Presidential Commission as well as

⁶ Most laborers worked one rotation of 24 days earning 5 dollars (200HTG) per day. Supervisors and team leaders earned more(600 and 300 HTG respectively). CFW paid to supervisors and team leaders not included in this indicator.

USAID and GOH to set up 25 teams, including 3 all-women teams, with community groups to assist in working in these areas of high insecurity.

These direct employment opportunities satisfied the objective of infusing cash into the economy. An internal evaluation of the CFW activities found that 95% of CFW participants would not otherwise have been engaged in income generating activities in the absence of these activities in their community. Beneficiaries used the income earned to purchase food and necessity goods. Most (80%) reported that the majority of their CFW wages were used to purchase food. As a result of CFW activities, average household income increased. In sites analyzed by the internal evaluation team, prior to CFW projects the majority of households were earning less than 2,500 HTG per month. Following the earthquake the average income rose to between 2,500-5,000 HTG.

CFW activities benefitted individuals in Port au Prince, Leogane, Grand Goâve, Petit Goâve and Cap Haitian. Given the concentration of disaster affected persons in Port-au-Prince, CHF concentrated CFW activities in the capital. 43% of all CFW participants were in the capital (in Petion-ville, Delmas, Tabarre, Croix-des-Bouquet, Port-au-Prince, and Carrefour).

Selection

Given the degree of unemployment and extreme need, selection of beneficiaries was important yet challenging. The Mayor's Office provided a list of individuals they hoped would be used as CFW participants. While many organizations directly used this list, CHF felt that the list had too few women and did not prioritize the most vulnerable.⁷ As a result, a collaborative selection process was used which engaged local authorities, community-based organizations (CBOs) and beneficiary communities. The RIG report suggested that this approach, taken by both CHF and IOM, was a more transparent and appropriate approach.

Prior to selecting participants, CHF's project management teams held meetings with local authorities and community members to discuss the aims and objectives of the CFW project. Following this initial meeting, local authorities, community leaders and other community members met to develop a mutually agreed upon selection criteria: the selection criteria developed restricted eligibility to one member per family per rotation; participants must be residents of the zone of the activity; and each team needed to have at least four women. CHF added that participants must be between 18-65 years old to comply with international humanitarian law. For teams involved in less labor intensive activities, a preference was given to disabled persons.

The recruitment of CFW participants was managed by respected local CBOs using the agreed upon criteria. Lists were validated publicly by a team of community members. The final list of participants was approved by both CHF staff and the municipality. Once selected by the community and validated by CHF and the municipality, each CFW participant provided a photocopy of his/her National ID Card and signed a short term employment form. This information was used to develop attendance sheets and payroll.

Involvement of Women

Recruitment of women proved to be more of a challenge than anticipated. Over the course of the project, progress was made, increasing from 21% in April to 28% in May and ultimately to 46% in June. The major shortfall was in Port-au-Prince where there was great demand for jobs by unemployed males in the most affected communities. Selection of women as team leaders and controllers helped ensure adherence to the selection criteria outlined above, which contemplated the inclusion of 40% of women. In Fort National, three all-female teams were established to set an example of women's capacities in an area where female participation rates were lagging. Over the course of the project, 5,064 women were involved in CFW activities. The following table stratifies participation by region.

⁷ The list provided by the municipality was used during the first few rotations. By April 2010, the CHF team recognized limitations of this list and developed the process described here.

	PAP	Petit Goave	Grand Goave	Leogane	Cap Haitian	Grand Total
Number of persons employed	6,441	4,311	1,389	2,113	614	14,868
Percent Female	29%	36%	39%	37%	51%	34%

Safety

To ensure the safety of CFW participants, CHF hired an engineering firm to provide training on safety issues at dangerous sites. The firm trained CFW team leaders on applying and enforcing regulations outlined by the Construction Safety Association of Ontario. The regulations highlight guidance on the appropriate use of hard hats, eye protection, gloves, and boots to prevent or reduce the severity of injury if an accident occurs. CHF provided all employees with hard hats, gloves, boots, safety glasses, shirts and face masks. Initially CHF issued hard hats for heavy equipment teams and CFW teams involved in demolition, but only caps for CFW workers involved in low risk activities such as clearing canals and streets. Following the recommendations of the RIG audit, CHF procured and issued hard hats to all CFW participants. Procuring high-quality gloves and other equipment in the local market proved difficult, but, to the extent possible, all safety requirements were upheld. CFW workers were provided workers compensation insurance as well as basic health insurance. Over the course of the project, there were no major work-related injuries to CFW participants.

Fraud / Payroll Systems

The RIG audit found that CHF had, “developed and implemented effective controls over their worker payroll systems to minimize occurrences of payroll fraud.”⁸ USAID/Haiti completed a thorough review of CHF’s financial controls validating systems and found them to be “generally affective.” Attendance lists discussed above were used for payroll. The name, age, gender, national identification number, and phone number for each participant was collected and provided to Fonkoze. Using the information, Fonkoze issued envelopes with the exact cash to all participants.⁹ CHF disbursed a total of \$1.7 million in direct payment of wages through Fonkoze. CHF had previously worked with Fonkoze on CFW programs prior to the earthquake which enabled faster start-up.

CFW Beneficiaries

As mentioned above, 14,868 individuals benefitted from CFW activities under the CLEARS 1 project. This figure is slightly short of the planned target of 16,000. CHF attributes the shortfall to the following circumstances:

- As proposed, CFW teams were to work 20 day rotations. This figure was derived from the model used under KATA.¹⁰ Given the severity and urgency of the need following the earthquake, workers were willing to work six days a week. Correspondingly, CHF advocated for a 24 day cycle rather than the planned 20 day cycle. The addition of the 4 extra days increased the budgeted amount per person.
- The initial target was based on a budget of \$5 per day (200HTG) for all CFW participants. Given the scale of the operation, to appropriately manage CFW activities and ensure efficient and safe operations, CHF determined it was necessary to hire controllers to oversee each team and supervisors to manage each site. These individuals were more skilled and carried more responsibility than other CFW participants. As a result they were paid more (\$12.50 and \$6.25 /day respectively). Using supervisors increased efficiency and productivity but their higher wages reduced the funds available to hire standard CFW participants.
- The initial budget did not account a handling fee charged by Fonkoze for payroll.

⁸ Regional Inspector General Audit of USAID’s Cash-for-Work Activities in Haiti. Audit Report No 1-521-10-009-P. September 24, 2010.

⁹ This system was ultimately replaced by a voucher program in later projects.

¹⁰ \$104 million USAID funded Job Creation and Economic Development Program implemented in Haiti between 2006 and 2011.

Other Beneficiaries

In terms of absolute numbers, the primary employment provided by the project was through CFW activities. Yet CFW was not the only temporary employment created by CLEARs 1. HFH reported hiring 211 Haitians to assist with latrine construction. This employment was also supported by the on-site vocational training in construction.

Sector: Shelter and Settlements (S&S)

Objective: Provide earthquake affected households with transitional shelter.

Sub-Sector: Emergency/Transitional Shelter

Indicator Table 3. Market Infrastructure Rehabilitation

	Indicator		Target	Total Achieved	Percent Achieved
Indicator 1	Number of households receiving Emergency/ Transitional shelter, pursuant to SPHERE standards and FOG guidelines	Total	5,490 ¹¹	5,485	99.9%
		T-Shelter (CHF)	4,500	4,495 ¹²	99.9%
		T-shelter (HFH)	440	440	100%
		HFA/ IDP Shelter Solutions	550	550	100%
Indicator 2	Percent of total affected population receiving Emergency/Transitional shelter assistance		1.8% ¹³	1.8%	100%
Indicator 3	Total USD amount and percent of approved budget spent in the affected local economy		--	3,623,255	--
			30% ¹⁴	40%	133%

The earthquake left over a million Haitians without adequate shelter. Adequate shelter is fundamental for the safety, security and wellbeing of people as well as the economic wellbeing of households. To that aim, OFDA funded CHF to construct emergency and transitional shelters for displaced families. Over the course of the project a total of 5,485 shelter solutions were provided benefitting more than 27,425 individuals. All shelters were built in accordance with SPHERE standards. The following table includes a break down by location and shelter solution type:

Location	Partner	Shelter Solution	Quantity
Port-au-Prince	CHF	Wood Framed T-Shelters	2,500
Petit Goave	CHF	Metal Framed T-shelters	295
Leogane	CHF	Metal Framed T-shelters	1,700
Cabaret	HFH	Wood Framed T-Shelters	440
Cap Haitien	CHF	Host Family Assistance Vouchers	550
Total T-shelters			4,935

¹¹ Target amended from 6,890 to 6,040 in May 2010 and again in June to 5,490. The change was approved by OFDA. The original proposal included funds for 850 retrofit kits to be used to strengthen the shelters of 850 families who had already constructed their own shelters. CHF shelters teams were not able to identify any households that needed these kits. The funds were reallocated to strengthen CHF-built shelters with hurricane straps and latrines with improved foundations. The target was amended again in June to reflect a revision in the total number of HFA Shelter Solutions targeted from 1100 to 550 given logistic complexities of the voucher system. The total number of transitional shelters has not changed.

¹² 2,500 in Port-au-Prince, 1,700 in Leogane, 300 in Petit Goave. (An additional 200 wood frame structures were built in the same project areas using alternative funding from Shelter Box.)

¹³ No target was provided for this indicator in the proposal. Target based on the following calculation: (5,490 households provided shelter x 5 people per family) / 1.5 million left homeless by the earthquake = 1.5%. The total homeless/affected figure comes from the UN/GOH.

¹⁴ Target set by CHF and OFDA in October (not included in proposal).

With extensive experience in Haiti and in post-disaster settings, CHF was able to begin scaling up activities quickly. The Shelter Cluster reported a global target of 125,000 shelters to be built before the first rainy season. By the end of June, 2,071 shelters were constructed by the 100+ agencies working in shelter. Of those, CHF was responsible for 1,065 shelters, 51% of all shelters.

The following sections discuss the t-shelters and shelter solutions provided during the project. Site selection was based on information gathered at cluster meetings held at IDP camps, UN sites, local authorities, and work of partner organizations. CHF also met with the mayors to discuss local priority areas and sign MOUs with the municipalities. Ultimately, this information and CHF's local knowledge and connections built over the past decade were used to decide on target areas for shelter interventions. Transitional shelter models were based on need assessments with priority given to those that were easy and fast to assemble and multi-disaster resistant.

Wood Framed Shelters - Port-au-Prince

Using a beneficiary list provided by the Mayor's office as a starting point, CHF worked to identify informal settlements and poor neighborhoods with significant damage for shelter recovery activities. To triangulate vulnerability assessments, project staff consulted with local organizations and community leadership. The following factors were considered in beneficiary selection:

- Disaster Risk: Land plot was not exposed to structural or environmental hazards—drainage, flooding, falling debris, etc.
- Space: Land plot met the minimum safe and CHF-approved space for building a house for 5 people.
- Vulnerability: Single, female-led households, the elderly, and households with more than four family members were prioritized for immediate assistance.
- Land Tenure: Household could prove that they lived there before the earthquake, verified by documents, or three neighbors who can verify and sign. For those renting land before, approval from property owner sufficed.

Based on these criteria, about 50% of registered beneficiaries were women-headed households. While later projects did ensure housing availability for renting and landless persons, early activities under CLEARS 1 targeted previous homeowners to avoid the added complexity of determining viable rental agreements. The majority (91%) of families benefitting from shelter solutions had proof of ownership or could verify ownership through consultation with community leaders.

While formal land titles were generally unavailable, shelter plots were identified through a community-lead method using a process of consensus confirmed by written statements by community members and local leadership as land tenure proof. Mobilizers met with representatives of target camps/communities and together they registered each beneficiary's information and documented their location (GPS). Coordination of shelter construction teams and CFW teams helped assure rubble and dangerous materials were removed from the land plot and access paths, a serious hinderance for many organizations. Engineers oversaw construction of all shelters to assure the placement of t-shelters was safe which reduced vulnerability.

The shelters used by CHF in Port-au-Prince were adapted from designs used in Georgia, Gaza, Peru and Indonesia. The wooden shelter had an area of 18m² and was compliant with SPHERE standards for a family of five. The wood frame structures were built primarily from timber and corrugated galvanized iron sheets. Recycled local steel was used for the construction of t-shelter roofs where available. Shelters were clad with plastic tarpaulins and installed on a foundation of concrete. The main bearing wooden columns were anchored to the soil using cast-in place concrete

piers. Shelters include mosquito shielded ventilation. The life expectancy of this structure was 24 to 48 months.¹⁵ Each structure costs roughly \$850-1,000 to construct, including labor.

The shelter was designed to ensure the shelters were resistant to disasters and quick to assemble. With respect to speed, shelters could be assembled in less than five hours. A team of one skilled carpenter and two unskilled laborers built two shelters a day. A system of paying laborers based on output (per shelter) rather than by day enabled this increased productivity. On average, the project completed more than 10 wooden shelters per day.

Several design considerations ensured disaster resistance. The shelters were erected on a floor made of recycled rubble and cement to reduce vulnerability from flooding. All parts of the shelter are firmly joined to ensure resistance to adverse weather and earthquakes. The shelters were tested considerably in 2010. The hurricane-force wind storm in late September damaged 60 wooden shelters previously erected in Port-au-Prince. Following the storms, the structures were repaired and strengthened with hurricane straps and anchored to the ground by the four wooden corner posts. Funds were re-appropriated so that these additional materials could be purchased to strengthen the wood framed shelters. All shelters were upgraded with hurricane straps, anchors and additional roofing screws. The last 571 shelters built by the project were constructed with plywood rather than plastic sheeting to ensure hurricane resistance. As a result, all shelters survived Hurricane Thomas which hit a month later. Flexible funding and programming enabled CLEARs 1 project activities to be responsive to the needs of beneficiaries and ensure that the safety of beneficiaries was prioritized.

While unable to complete shelters within the original time frame, CHF outpaced other shelter actors working in Port-au-Prince. This efficiency was the result of familiarity with Haitian systems especially procurement and customs developed over a decade of working in Haiti. While customs delays did stall some project activities, local knowledge helped CHF work around these bureaucratic issues where possible. To procure materials needed for wooden shelters, CHF worked with local vendors which sourced timber in bulk from the USA and the Dominican Republic. Materials were delivered directly to warehouses, enabling lower transportation costs. Shelter teams organized the delivery of specific material quantities to construction sites on a daily or weekly basis, to reduce the possibility of graft and wastage. Local knowledge helped navigate customs delays for materials such as plastic sheeting¹⁶ which were delayed due to high demand and slow processing.

All tools used for efficient transitional shelter construction—beneficiary registration forms, site assessment forms, beneficiary agreement forms, delivery of materials forms, and certificates for handover—have been shared with other partners involved in shelter recovery.

Wood Framed Shelters - Cabaret

Between February and August 2010, HFH registered and provided shelter to 440 displaced families in Cabaret. All 440 beneficiary families received a Certificate of Ownership signed by HFH Haiti's National Director and a representative of their community or local authority. The shelters constructed by HFH have a covered floor space of 18m², clad with tarps on a timber framework and with a roof of galvanized iron corrugated sheets. The shelter is built on small concrete pads, has three tarp covered windows and door, a 6 m² open porch, structural cross-bracing, foundation and roof steel straps to provide a degree of resistance to earthquakes and storms and can be upgraded. The design improved over time and the first 240 shelters were of the split roof design while the latter 200 were of the double pitch roof design to reduce water ingress and improve wind resistance. An external evaluation found that the shelters were in "good condition" six months after construction was completed.

¹⁵ Range based on reports from previous disasters that plastic tarpaulins last 24 months. All other materials are projected to last up to 48 months.

¹⁶ All plastic sheeting used in the project was an in-kind donation from OFDA.

Beneficiary selection was based on need and vulnerability. The majority (81%) of families receiving transitional shelters met at least one vulnerability parameter. Of all beneficiary families, 77% were female-headed, 38% are single parents, and 74% made less than minimum wage, reporting an average income of \$99/month or less. Given a need to demonstrate ties to the land,¹⁷ most families receiving shelter assistance were from the Cabaret area and have relocated only a few meters away.

An internal evaluation¹⁸ of the shelters found that satisfaction with the shelters, construction quality, and project implementation is high. One month after completion, HFH noted a 100% occupancy rate, with an average of 4.8 persons in each shelter. Few land access issues or changes in possession were noted in the evaluation. The transitional shelters are neither as large nor as preeminent as those that housed the displaced before the earthquake. The beneficiaries reported that, the majority of residents in Cabaret lived in two (54%) or three (23%) bedroom houses. Most (83%) had hard walls made of block or brick. Yet the transitional shelters served their purpose of providing safe, private space. Most were finished before the first rainy season.

Steel Frame Shelters – Leogane and Petit Goave

In addition to the wood frame shelters, CHF constructed 2000 light gauge steel shelters, 1,700 in Leogane and 300 in Petit-Goave. The shelter was adapted from the steel frame shelters used by CHF in Sri-Lanka post-tsunami. This was the first time steel framed structures were used in Haiti. The shelters were piloted as a more appropriate design given that they are multi-hazard (hurricane and earthquake) resistant, portable, and durable. The shelters can be used as the frame for more permanent shelters. Resistant to wind speeds up to 120-140 mph, they were also more resistant to hurricanes and heavy rain than the wood frame solutions, an important feature in hurricane prone regions.¹⁹

The shelters are similar in dimension to the wood frame shelters (18m²) and are also SPHERE compliant. The shelters were made of light-gauge steel and have a projected lifespan of 10-20 years. The shelter components were shipped pre-cut from USA, from an American design firm in 40 containers of 50 shelters per container. Once assembled on site, shelters were secured to the ground using a cement platform constructed by local masons. Shelters were clad in plastic tarpaulin and metal sheet roofs. Families received wooden doors and windows, although some preferred to install their own. Including labor, transportation and materials, the shelters cost \$2,500 to \$2,750.

20

To enable on-site construction, CHF trained 200 community members in the use of power tools and assembly. Training took 4-5 days per team. The workers were divided into teams to prefabricate, deliver and install the t-shelters. Training was intensive because the process was complicated and required many steps. Shelters were partially pre-assembled at workshops off site and then delivered to neighborhood sites. CHF hired masons to install concrete slab floors. Once the foundation was finished, shelters were installed. In response to beneficiary input, wooden doors and windows were added. Assembly of the steel frame shelters was labor intensive requiring people dedicated to pre-assembly (59 workers), transport (36 workers), storage (12 workers) and installation (ten teams of 6 workers). While the shelters required considerably more training and pre-installation logistics, once the assembly line was fully operational CHF was able to install an average of 17 shelters per day.

Activities within the control of project staff were done efficiently and cost-effectively. The same model discussed above of paying laborers per shelter instead of per day was used in the construction of metal shelters. As an alternative to expensive rental vehicles, tap-tap cabs (which serve as mass transportation in Haiti) were hired locally

¹⁷ Of the families selected as beneficiaries, 65% have secured land tenure. Fewer have administrative proof.

¹⁸ The evaluation conclusions are based on household assessments of 173 families, 4 focus group meetings, interviews with HFH staff and key external actors.

¹⁹ The wood frame shelters are resistant to category one hurricanes: less than 95 mph.

²⁰ The costs were higher than expected. Materials alone cost \$1,300 versus an original budgeted amount of \$1,000 per shelter. Materials transport cost \$70,000.

to transport workers and materials to the field. Yet despite these innovations, the steel frame shelters proved to be a difficult model to construct in Haiti given challenges outside the control of the project: (1) the quality of imported materials, (2) the cost and delays of importing materials, and (3) a lack of local materials and capacity to install the structures.

- Material Quality: While both wood and steel frame shelters used plastic tarpaulins to increase expediency of construction and keep prices low, quality varied. The plastic provided by the US company that made the steel frame shelters was of lower quality. Plastic used on wood framed shelters was SPHERE compliant; it is composed of a woven ribbon of high density polyethylene which ensures a minimal thickness, UV Inhibitor, strength, and is flame retardant. It also is more durable. The tarps procured with the metal frame shelters also did not include windows and doors. As soon as these concerns were identified, CHF took actions to address these problems such as working with local contractors to provide wooden doors and windows to all beneficiaries. While these problems did affect satisfaction,²¹ at the end of the project 100% of the shelters were completed.
- Procurement and Importing: Beyond problems with the quality of imported building materials, the process of procurement and shipping the pre-fabricated shelters slowed assembly. Whereas CHF started producing wood-frame shelters one month after the program started, it took five months to start delivering steel frame shelters. Customs clearance averaged two months, a delay experienced by all organizations involved in shelter. While ordered in the first quarter of the project, the last of the steel framed shelters did not clear customs until late September, one month before the original agreement completion date. Both the costs and timeline of international procurement and shipping were underestimated.
- Local Materials and Capacity: The procurement of power tools and spare parts was challenging in country given local stock shortages. The local capacity to use power tools or build metal structures did not exist and had to be developed. The extent of training needs was not anticipated. Weather and security issues further stalled the project.

As a result of these external factors, the metal structures proved to be very complicated, more expensive and slower to install. The wood framed shelters had no pre-assembly and were less labor intensive, requiring just four teams of one engineer and one mobilizer each. Whereas a number of wood frame shelters were completed by April 2010, installation of the first metal structure was not completed until August, and the first shelter was not ultimately finished (with door, window and completed floor) until November. Recognizing the challenges of the metal structures, CHF built an Operation Center in Leogane and scaled up staffing levels. These investments enabled CHF to finish construction of all planned shelters.

As a contribution, families helped CHF clear rubble from their property. The shelters were chosen because they can become the core structure of a more permanent brick or concrete home in the future; households are responsible for any incremental upgrading of their shelters. A CHF internal evaluation found that 23% of beneficiaries had made improvements to the shelters. Most reinforced the walls with more resistant or durable materials at an average cost of US\$100.

IDP-Host Family Shelter Solutions

Following the earthquake, many families left Port-au-Prince to find shelter in the provinces at homes of friends or relatives. For these displaced and thus landless persons, transitional shelters were not viable options. The HFA component of the CLEARS 1 project worked to ensure the needs of the earthquake affected persons and their host families were met. Assistance was tailored to the needs of both displaced and hosting heads of household. Each household unit (defined as the displaced and hosting families) was offered a choice of five vouchers— small business grants, school fees, school supplies, household supplies, and work tools— in any combination, up to a value of \$850, the cost of a wood-frame shelter. Project staff worked with each household to select the vouchers needed to support

²¹ An internal evaluation found that 68% of wood frame shelter recipients and 38% of steel frame shelter recipients were satisfied with the shelter they received.

the joint family unit. Both families signed tri-partite agreements with the organization and a local government representative to document their cooperation, agreement and intent to mitigate any problems with local officials. Providing a menu of assistance options allowed beneficiary families to prioritize their own needs. Sample packages illustrated in the following table:

Assistance Package:	Total Vouchers Distributed	No. of Families
Small Business grant voucher	1232	546
Household supplies voucher	869	480
School supplies voucher	622	440
School fees voucher	278	125
Work tools voucher	73	59

Between April and September 2010, the IDP-host family assistance component of the project provided housing voucher alternatives to 550 IDPs and their host families in three communities—Cap Haitian, Limbe and Limonade. The 550 households represented 7,245 individuals, comprising 3,839 host family members and 3,406 IDP members, with 901 host family children and 772 IDP children under 17 years of age. The project initially targeted 1,100 families. This target was amended to 550 families in June in response to complexities in registering and vetting households. It was determined that the capacity to complete the activities and ensure quality in monitoring grants by the end of the CLEARs 1 contract would not be possible if the total number of beneficiaries was increased beyond 550. The remaining funds were used to upgrade t-shelters in Port-au-Prince, including the previously mentioned 571 plywood clad shelters.

As shown in the table above, most families chose at least one small business grant. These grants were followed in popularity by housing supplies, school fees, school supplies, and work tools. These grants gave families the means to secure basic households staples and supplies. The small business grant provided access to start-up capital in order to set up small scale businesses, such as selling phone cards, cosmetics and shoes. As a result of the small business grants, the percent of IDPs reporting that they have a stable source of income increased from 17% to 43%. These grants played an important role in livelihood recovery. 60% of the small businesses set up under the CLEARs HFA were still running six months after the project ended; for 75% of those IDP families the small business is the sole source of income.

The HFA project strived to offer opportunities for IDP- host family households to access education through the school fees and school supplies assistance grants. In the communes of Cap Haitian and Limonade, 125 families were able to send 185 children to school at the start of the Fall 2011 school year. Unfortunately, due to the damage caused by the earthquake, the school year started late. At the completion of the HFA component of the project in October, many schools had not yet reopened. CHF was unable to contact school authorities in Limbe. As a result, many families were unable to use their school vouchers before the end of the HFA project. Still, the distribution of 622 school supply vouchers allowed more than 1,000 children to have access to education materials such as books, notebooks, and pens.

A secondary aim of the HFA program was encouraging displaced persons to stay in the location they were hosted. Given the pre-earthquake density of Port-au-Prince and the scale of the recovery effort, this was important. In a rapid survey done 8 months after the project ended, CHF found that 87% IDPs reported that they will not return to Port-au-Prince. Those that did leave left in search of work (48%) or security (32%). Generally, beneficiaries reported that because of the HFA program, basic needs were met and 98% of IDPs believe they are now living in a safer location.

CHF participated in the Host Family Working Group and has shared its voucher system model, including registration forms and vouchers which were adopted by the Red Cross.

Effect on Local Economy

Where possible, efforts were taken to ensure shelter production benefitted the local economy. Most t-shelter materials were procured locally with the exception of the 2,000 steed-framed shelters and an initial procurement of timber. Most timber and all roofing materials, cement, nails, screws, hinges, anchors and hurricane straps were procured locally. In addition, CHF spent more than \$900,000 on labor generating nearly 200,000 days of employment for 85-100 carpenters in Port-au-Prince and around 300 carpenters, masons, and daily workers in Leogane and Petit Goave. These figures do not include transportation, manufacturing, or CFW jobs. Local procurement was preferred as it enabled construction to begin within a month of the earthquake. It was also beneficial to Haiti as the cash stimulation which enabled livelihood recovery.

These direct costs do not include many other significant effects on the local economy. Incremental development of homes encourages a market for building materials. Provision of shelters provide rent saving mechanisms. Transitional shelters also enable recovery of home-based enterprises and small businesses. 100% of the HFA resources were re-injected into the local economy for procurement of goods and services.

Sector: Water, Sanitation, and Hygiene (WASH)

Objective: To improve the sanitation and health conditions of earthquake-affected populations.

Sub-Sector: Sanitation

Indicator Table 4. Sanitation

	Indicator	Target	Total Achieved	Percent Achieved
Indicator 1	Number and percent of household latrines rehabilitated/completed that are clean and in use in compliance with SPHERE Standards	3,191 ²²	3,175 ²³	99.5%
		100%	100%	100%
Indicator 2	Number and percent of household hand washing facilities completed and in use. ²⁴	--	--	--
Indicator 3	Number and percent of households disposing of solid waste appropriately ²⁵	--	--	--

The quality of sanitation services in Haiti was very low before the earthquake; UN-Habitat estimated that only half of the population had access to latrines. The limited access was exacerbated by the earthquake. In areas benefitting from the CLEARS 1 project, CHF found that less than 6% of families had access to a functioning latrine, less than the national average (34%) estimated by UNICEF. Open defecation posed a significant threat to health and wellbeing. To

²² Target amended from 6,040 to 3,191 (2,363 to be completed by CHF and 391 to be built by HFH under CLEARS and 437 to be built by CHF under KATYE). The original proposed target for latrines was based on the objective of providing one for every family receiving a transitional shelter. However, this did not reflect the Host Family IDP project, which was successfully developed in Cap Haitian, offering other shelter solutions—a choice of vouchers. The latrine target for CHF's component was subsequently changed to 3,750 to reflect the updated costs in the budget. It was changed again because of environmental concerns in Leogane where the water table is very high. The model was re-designed and costs considerations caused the target to be reduced again to 2,800— 1,600 for Port-au-Prince and 1,200 for Leogane. The target was ultimately amended from 2,800 to 1,323 (+437 under KATYE).

²³ 2,668 single VIP latrines built by CHF, 378 single VIP latrines built by HFH, and 10 dual family latrines built by HFH.

²⁴ Indicator 2 is not applicable to CLEARS. There are no hand- washing facilities in the CLEARS proposal, only a hygiene awareness campaign.

²⁵ Indicator 3 is not applicable to CELARS. CHF proposed only a hygiene awareness campaign and has not budgeted for a hygiene and sanitation evaluation.

mitigate the risk of disease, latrines and education on proper sanitation were provided for beneficiary households who did not already have functioning latrine or whose latrine was damaged by the earthquake.

The initial aim was to ensure that all transitional shelters constructed under the project have access to latrines per SPHERE standards. Given the high cost of materials and unanticipated complexity given land scarcity and high water tables, this goal was amended over the course of the project. Ultimately the project focused on using available resources to providing latrines in areas where the need was greatest and the threat of disease most imminent—dense slums in Port-au-Prince. The following table documents the initial aims and ultimate accomplishments.

	CHF - CLEARS 1	CHF - Katye	HFH – CLEARS 1		Total
Proposed Latrine Targets	5,600	--	440	--	6,040
Original Latrine Targets	3,750	--	440	--	4,190
Revised Latrine Targets	2,363	437	381	10*	3,191
Achieved	2,668	116**	381	10*	3,175
Percentage Complete	113%	27%	100%	100%	99.5%

*Elevated dual cabin communal latrines serving 42 families

** 116 pour flush toilets serving 536 households. See Katye final report for more complete explanation.

In total it is estimated that 3,207 families (16,035 individuals) benefitted from the sanitation activities described in the report. The majority of these beneficiaries also received transitional shelters and benefited from rubble removal activities. In addition, an estimated 815 families²⁶ (4,075 individuals) who did not receive shelters benefitted from latrines. These figures do not include the 137,386 individuals that benefitted from cholera education activities.

Latrine Construction in Port-au-Prince

By the end of the project, 2,668 ventilated improved pit (VIP) latrines were constructed in Port-au-Prince. The primary target of the latrines was beneficiaries of transitional shelters in Port-au-Prince who did not otherwise have access to latrines. In addition to these families, over 600²⁷ additional families in Croix-des-Bouquets, Tabarre, Petion-ville, and Delmas received ventilated improved pit (VIP) latrines. These additional beneficiaries were added in response to assessments which suggested that some shelter beneficiaries already had a latrine, did not want a latrine, or had no available land on which to build the toilet. CHF in consultation with OFDA, decided to concentrate all its latrines in Port-au-Prince given it was the area of greatest need.

Latrines were constructed by skilled masons with the assistance of beneficiary households who provided unskilled labor. CHF dug the pit and provided both the structure and platform. The platforms used in CLEARS 1 were cement slabs enabling easy maintenance. The initial design which included timber platforms were adapted given concerns that they would rot or become termite infested. To reduce the price per latrine, PVC pipes were used for the ventilation chimney and the walls were made of heavy plastic sheeting. CHF provided education and support to families interested in improving their latrines. In one case, CHF noted that a household upgraded the facility by installing a porcelain toilet and other accessories such as brass handles on the door (see CLEARS 1 Success Story).

As documented above, the target number of latrines planned was amended several times over the course of the project, a reflection of the contextual challenges—high operating costs, logistical challenges of importing supplies, physical challenges of inadequate space and high water tables. While both organizations had significant experience in Haiti, the scale of the disaster meant that the cost of doing business in every aspect of the program was much

²⁶ An estimated 8% of latrines in Cabaret and 25% of latrines in Port-au-Prince benefitted families that were not beneficiaries of shelter activities, in addition to the KATYE beneficiaries.

²⁷ Of the 2,500 t-shelters in Port-au-Prince, nearly 25% already had access or had no space for latrines.

higher than anticipated. The price of fuel alone was subject to extreme inflation affecting the cost of fabricating, transporting and storing materials. Even direct labor costs (foreman, crew supervisors and construction labor) were more than originally budgeted. The cost per t-shelter averaged \$160/unit for labor. The latrine labor costs varied by type, from approximately \$90/single VIP-latrine to \$192 for a dual stall raised latrine. To compensate for these higher costs, the total number of latrines was amended and expenses were supplemented with additional funds from other sources.²⁸

Beyond costs, procuring materials proved a major challenge. Necessary materials were not available in country immediately after the earthquake in the quantities needed which required CHF to procure them internationally. Timber procured internationally did not clear customs until late September. To avoid the storage costs, CHF did not start procurement of local materials until the limber cleared. Consequently, latrine prefabrication did not begin until mid-October.

Latrine Construction in Cabaret

The initial aim of the activities in Cabaret was to provide all families that had a shelter with an individual, improved latrine. Ultimately, a lack of adequate space combined with the existing high water table prevented the provision of 440 individual latrines. Adapting to the contextual realities, CLEARs 1 was able to provide 99% of families needed latrines with access to facilities.

The plan of installing 440 latrines was amended based on assessment results which indicated that a total of 59 of the 440 families who received transitional shelters in the Cabaret area already had access to a latrine (26), lacked space for a latrine (6), or were located in areas with a high water table prohibitive (27) to latrine construction. Therefore, 381 families met the criteria for VIP single-stall latrines. Of the 381 VIP single-stall latrines constructed, 3 were damaged by hurricanes and heavy rains and consequently had seepage issues.

To ensure access to improved sanitation facilities for the 3 families originally served by these VIP latrines as well as the families located on high water tables, HFH built 3 elevated dual-stall and 7 VIP-type dual-stall latrines. The three elevated latrines were completed in areas with a high water table (Garescher, Malingue and Leveque) as were the seven VIP-type dual-stall latrines (Lakou Chadwon, Karyan and Rue la Paix). Extensive work was needed excavating pits to determine which areas would be suitable for latrine construction due to the high water table in Cabaret. This excavation activity took much longer than anticipated and required significant additional labor. This work was necessary in order to reduce the risk of groundwater contamination, protecting the health of the families and community. In total, these 10 dual stall latrines currently provide access for 42 t-shelter beneficiary families.

The latrines constructed using CLEARs 1 funds—381 individual latrines (three later proved unusable) and 10 dual stall latrines—ensured access for 420 families, 388 of which also benefitted from CLEARs 1 funded t-shelters. Using funding from other sources, HFH worked to ensure that nearly all families that needed latrines received them. Ultimately all but six families who lacked adequate space were supplied latrines that accommodate their needs, protect the water supply from contamination, and made use of the existing funds in a cost-effective manner. The following table documents the need and construction for improved latrines:

Improved Latrines Constructed in Cabaret		
Households that Received Transitional Shelters Under CLEARs 1	440	--
Households with Access to Functional Latrines	26	--
Total Deficit	414	

²⁸ For materials and their transport for the t-shelters and latrines, CLEARs used match funding from African American Baptist Mission Collaboration (AABMC) (\$153,000), and GIK donations from Weyerhaeuser, Arcelor Mittal and the UK's Department for International Development (DFID) to cover the difference.

	(T-Shelter) ²⁹	(All)
Households Provided CLEARS Funded VIP Single-stall Latrines	378	378
Households Provided CLEARS Funded Elevated, Twin VIP Latrines ³⁰	10	42 ³¹
Households Provided Elevated Twin / VIP latrines Funded by Another Donor	20	20
Total Families Served	408	440
Percent of Households Needing Latrines With Access	99%	

In addition to the 440 families originally targeted (those that received transitional shelters under CLEARS 1), HFH/CHF coordinated with Catholic Relief Services (CRS) to provide 32 families that received transitional shelters under a USAID OFDA funded project implemented by CRS and by the African-American Baptist Mission Collaboration with access to latrines.

Throughout the CLEARS 1 project, HFH faced delays related to hurricanes, political unrest and the cholera outbreak. To compensate for these delays, HFH scaled up their staff. A new contractor was hired specifically to oversee the construction of latrines and a water, sanitation and hygiene (WASH) specialist was hired after the external evaluation was conducted to oversee the design of communal latrines. In total, the Cabaret HRC employed up to 211 Haitians.³² 190 of these workers received on-site vocational training in construction with 95 persons employed at least six months and 95 persons employed less than six months. Challenges at the community level further stalled the project such as difficulty negotiating land for dual-stall latrines. Extensive community mobilization was necessary but ultimately the land was made available.

Cholera

In response to the cholera outbreak that hit Haiti in October 2010, CHF received an OFDA agreement to reallocate \$25,000 from the sanitation and hygiene component in order to undertake cholera prevention and hygiene promotion activities in five areas: Gonaives, Port-au-Prince, Leogane, Cap Haitian and Carrefour. While not originally within the scope of the CLEARS 1 project, CHF used its community mobilizers and available resources to contribute to the outbreak response.

CHF worked with partner organizations with more experience in cholera prevention to ensure the CHF response was effective. CHF mobilization staff attended an all-day UNICEF training-of-trainers session. The mobilizers received presentation material like a power-point slideshow, reference materials, and two films and were instructed on how to perform practical simulations of oral rehydration solution (ORS) and hand-washing procedures. Following the training CHF mobilizers visited neighborhoods and communities based on the needs expressed by city and municipality officials and in coordination with other agencies working in the areas. The teams distributed Ministry of Health (MOH) printed material and flyers with cholera prevention messages and hygiene measures contributed by IOM. In total, the CHF cholera mobilization teams reached 137,386 beneficiaries, talking to them about cholera prevention and good hygiene practices, handing out cholera flyers and giving simulated presentations of ORS preparation and hand-washing.

The strategy of the cholera communication and education activities depended on the needs of the area. To ensure high coverage CHF worked with many municipality and NGO partners and used a variety of mediums from community meetings to radio broadcasts:

²⁹ Column includes only households that also benefitted from transitional shelters.

³⁰ 3 elevated dual-stall and 7 VIP-type dual-stall latrines

³¹ CLEARS coordinated with CRS to ensure 32 families benefitting t-shelters funded by USAID OFDA through CRS and by the African-American Baptist Mission Collaboration had access to the elevated latrines.

³² 211 includes individuals directly involved in construction (140), surveyors/guides/data entry (5), office staff including engineers (16), and workshops (50).

- **GONAIVES:** In Gonaives, 20 mobilizers reached 53,211 people and handed-out 12,000 Ministry of Health approved cholera flyers. To ensure the message was heard by all, sound trucks with megaphones were used. To ensure the messages were accepted and adopted, mobilizers met with community leaders, farmer's and fishermen's associations. Efforts were taken to reach rural communities on the outskirts of the city.
- **PORT-AU-PRINCE:** In Port-au-Prince, 9 mobilizers went door-to-door in the areas of Delmas 32, Ravine Pintade, Ave. Poupelard and Fort National. They were able to reach 26,825 people and handed out 11,800 cholera flyers. They conducted 22 community meetings and a seminar for all the Haytrac company staff.
- **CAP HAITIEN:** In Cap Haitien, 11 mobilizers reached out to 35,341 people. Many of these were children (26,096) since the mobilizers concentrated on going to many of the schools in the area. They also made 485 family visits and conducted 579 community meetings.
- **LEOGANE:** In Leogane, 6 mobilizers reached 15,514 people and handed out 5,815 flyers. Since there were less mobilizers and more ground to cover, an effort was made to organize more community meetings in churches, schools and community houses. The mobilizers made presentations and simulations at 106 community meetings in Leogane. For two weeks a live radio broadcast on Leogane's COOL FM was conducted by CHF's Communication Officer who had been specially trained through UNICEF on cholera prevention issues. The radio shows, which had live call-ins, had such a massive response that the radio show requested for more awareness raising shows to be transmitted by CHF.
- **CARREFOUR:** In Carrefour, CHF finished its final mobilization efforts reaching 6,495 people in 10 communes of the area. The mobilizers worked with the community leaders and the Mayor of Carrefour in setting up community meetings but also worked in close collaboration with officials from Médecins Sans Frontières who went with the mobilizers to the most affected areas of the zone. The 5 mobilizers were able to conduct seminars for the community leaders, held sessions in 9 schools, reaching out to over 2,440 students, and visited 5 IDP camps in the area.

Haiti Neighborhood Rebuilding Program (Katyè)

An innovative approach to urban disaster response, Katyè aimed to return IDPs back to healthier and safer neighborhoods by utilizing an integrated neighborhood approach. Combining the provision of emergency assistance with collaborative, in-depth planning, the project created a self-managed urban community. Over the course of the project, the Ravine Pintade area was transformed from an informal neighborhood to a more formal entity with committees for self-governance that linked with municipal authorities to ensure the provision of services and maintenance of infrastructure.

Designed with a learning approach, the model has also been shared with local government entities (including the mayor of Port-au-Prince, CIAT, DINEPA, MTPTC, SMCRS, MSPP), international working groups and clusters (shelter, health, WASH, protection) as well as many other organizations implementing reconstruction projects in Port-au-Prince.³³ USAID/OFDA study tours and presentations have enabled project staff to disseminate the methodology and lessons learned with respect to both technical and theoretical components of the project. This report aims to document the work of the project, successes and limitations, with a focus on the impact of the project evaluated against project indicators.

While the report is divided by sector, the integration of service provision is a major factor contributing to the success of the project. The integration of rubble removal with participatory community enumeration and planning ensured pragmatic solutions to land tenure problems. Integration of primary health care helped build community relations and the trust needed to negotiate public space from private land owners. Similarly, integrating protection into urban planning led to the installation of child safe guard rails and construction of pathways that are safe for handicapped and elderly individuals. The report aims to highlight these additional benefits of integrated service provision to overall program impact.

A final evaluation of the Katyè project was performed by an external evaluator in April 2012; a copy of the evaluation is annexed to this report.³⁴

Summary of Demonstrated Impact

- **Enabled the return of nearly 1,930 displaced persons** through the provision of shelter. All (105%) housing stock destroyed by the earthquake was replaced with the construction of 335 transitional shelters (260 one story, 75 two story), providing safe, private and appropriate shelters.³⁵
- **Reduced the vulnerability of the community to disasters** with the construction of DRR infrastructure: 2,357 linear meters of drainage canals to mitigate the impact of floods; 2,410 linear meters of retaining walls to mitigate earthquake or landslide impact; 465 linear meters of streets rehabilitate to improve circulation.
- **Created 1,892m² of public space** enabling wider pathways and green spaces which reduce overcrowding and improve quality of life. 171 private land owners agreed to reshape their plots to enable the creation of public space.
- Facilitated neighborhood recovery through the **removal of 32,531 m³ of rubble**.
- Provided an **economic stimulus of \$537,467 and livelihood support to 2,311 individuals** in the community, enabling them to rebuild their homes and businesses. Three of four households (73.3%) had at least one family member employed through CFW activities. Additionally, 36 youth benefitted from vocational support and 1,210 received contracts from local contractors for masonry work.

³³ Including the French, Haitian, International and British Red Cross, Cordaid, UMCOR

³⁴ Annex 1: Final Evaluation of the Katyè Project by Earl Kessler

³⁵ Explanation of all calculations available in Shelter and Settlement section of report.

- **Laid the foundation for the reconstruction of a more formalized community;** every resident is enumerated/mapped, every household has a signed contract documenting their rights to the property, and every shelter and pathway is mapped.
- **Improved community cohesion** and problem solving. Over 200 households agreed to reduce their plot size for public benefit. Nearly half (47%) of community members report an improved ability to problem solve using committees and an improved trust in fellow community members (45%) relative to before the earthquake.
- **Improved water quality** as illustrated by a reduction in the percent of households reliant on contaminated water (as measured by fecal coliform) from 37% to 1%. This success was achieved through evidence based water and hygiene education using field chlorine and coliform tests. At the project end, 95% of households were tested for coliform presence.
- Improved water access by nearly **doubling average daily water consumption**. Today, average water usage in the community is 17.2L per person. This represents a 182% increase from the baseline (6.1L/person/day). It is also a significant quantity relative to water access in neighboring communities (13.2L/person/day).
- Improved hygiene practices such that today **nearly all individuals wash their hands** before eating (99%) and after using the bathroom (99%), both significant improvements from the baseline (50% and 13%, respectively). Success was achieved through extensive community and household level hygiene and sanitation education reaching nearly all households (96%).
- Prevented cholera related to morbidity and mortality. At the height of the cholera outbreak, 11 cases of cholera were detected in neighborhoods surrounding the five zones (no cases were detected within the five zones). This number suggested a cumulative incidence of around 1.9 per 1000. This rate is significantly less than 31.5, the cumulative incidence in Port au Prince at the time.³⁶ These figures suggest that through education and prevention activities, Katye **prevented over 280 cases of cholera** and more than 2 cholera related deaths (assuming the Port-au-Prince case fatality of 0.9%).³⁷
- Improved geographical and financial access to primary health care services. Over the course of the project, access to a free clinic **saved the community an estimated \$8,263 in health care consultations** alone.³⁸ Patients also traveled half as far for services, a decline from 25 minutes at the baseline to under 10 minutes. Over 7,200 individuals were provided home health visits reducing traveling time to 0.
- Reintegrated children into the school system as illustrated by an **increase in school enrollment rates** from 46% to 87% over the course of the project. Simultaneously, Katye improved the quality of education by training educators from five local schools on protection and human rights principles.
- Shifted attitudes on child abuse and domestic violence to insure an **improved sense of safety** in the household. Nearly all (93%) individuals receiving training on corporal punishment reported that it changed their attitudes regarding hitting children. Half of all children report an improved sense of safety and wellbeing with respect to violence (49%) and natural disasters (58%).

The above was achieved despite the complexity and insecurity of the zone. Over the course of the project, one staff member was kidnapped and others received death threats and demands for money. Protests, often violent, have been a constant reality. Yet a strong partnership with the community kept activities moving. When a local gang (JAD) vandalized the clinic to demonstrate their frustration with the lack of attention by the program, Ravine Pintade community members took charge and invited them to participate in CFW activities in the Corvinton area. When a Katye team member was kidnapped leaving the project site, the community formed a search party. Strong community mobilization was instrumental to the success of the project.

³⁶ MSPP and PAHO (2011). Health Cluster Bulletin: Cholera and Post-Earthquake Response in Haiti. Available at: http://reliefweb.int/sites/reliefweb.int/files/resources/CB7BD7D9160F1FAF8525784F005691FF-Full_report.pdf

³⁷ MSPP and PAHO (2011). Health Cluster Bulletin: Cholera and Post-Earthquake Response in Haiti. Available at: http://reliefweb.int/sites/reliefweb.int/files/resources/CB7BD7D9160F1FAF8525784F005691FF-Full_report.pdf

³⁸ Calculation based on an average cost of clinic visits (not including tests / medication) at the seven most proximate clinics in the area (70.8HTG) multiplied by the average number of clinic visits at the KATYE clinic per month (319) multiplied by 15 months. Conversion assumes 41HTG=\$1USD.

Tools and Methods

Katye emphasized rigorous, evidenced based programming. Ensuring information was strategically collected and used for improving impact was central given the project was designed as a pilot. In January 2011, the Katye project conducted a comprehensive baseline assessment in which nearly all households living in the five zones were assessed (N=613). This data, as well as data previously collected in the area,³⁹ was used in designing the project to specifically target the needs of the population. This study assessed the impacts of the earthquake on the lives of those affected, including on shelter and displacement, land ownership and tenure, socio-economic and livelihood status, children's sense of safety and well-being, health of vulnerable populations, hygiene practices, and access to safe water sources. The baseline surveyors were trained on the use of survey tools, sampling methods and interview techniques for collecting and entering data; all survey tools were field-tested and available in English and Creole.

The baseline assessment was conducted in coordination with a comprehensive participatory enumeration of the population, gathering the name, age, sex and education level of each individual in the community. This enumeration was continuously amended throughout the project in coordination with community members as displaced persons returned and hosted populations left.⁴⁰ The high density, extreme informality and lack of clear delimitations in the community complicated topographic and enumeration surveys. Without community engagement and extensive verification, an accurate final result would not be possible. The enumeration was conducted in coordination with community mapping exercises which linked households and land plots and ultimately new t-shelters.

This baseline assessment was complemented by a midterm assessment (N=74) and a final household assessment (N=365). Both assessments utilized a simple-random sampling methodology and covered similar topics as the baseline assessment. The final assessment was performed in the five zones as well as Fort National to enable difference in difference assessment (both change over time and are relative to a comparative neighborhood). Fort National, the site ex-President René Prével identified as the focal point of his reconstruction efforts,⁴¹ is similar to the Ravine Pintade zone in terms of socioeconomic and health status of the population but has received significantly less international assistance.

Project monitoring and evaluation teams provided ongoing technical support to design, plan and implement the study at the field level. The teams ensured rigorous documentation of newly created public space as well as the community negotiations to obtain the land, disaster infrastructure installed in the project (pathways, drainage pipes, and retaining walls), rubble removal and t-shelter construction. A study of a patient's willingness to pay— composed of both household (N=150 households) and facility based assessments (N=7 clinics)—enabled evidenced-based decision making regarding the sustainability of a community-run health center. An assessment to find the of water contamination point identified improper use of filters and Aquatabs which led to improvements in WASH trainings and ultimately nearly universal access to potable water. Focus group discussions with community members helped track and understand patterns of returns: where and why people were returning to the zone. An assessment of youth (N=247 individuals) to identify interests, previous experience and desired occupations helped target livelihood trainings. These and many other assessments lead by the monitoring and evaluation team enabled continuous improvements to program implementation.

Results from these assessments are sited throughout the following report. Full results and methodologies are available.

³⁹ PCI was working in the Ravine Pintade area and surrounding areas prior to November 2010 as part of OFDA funded Agreement #: DFD-G-00-10-00093-00. Extensive data on health, protection, sanitation, housing access and basic demographics were collected under this project.

⁴⁰ Discrepancies from beneficiaries providing inconsistent or inaccurate information, changes as a result of project boundaries changing, and other necessary adaptations were also made as necessary.

⁴¹ Wheeler, W. (2011). What Haiti Needs Now (Step 1): Move the Rubble. The Pulitzer Center. Available at <http://pulitzercenter.org/articles/haiti-earthquake-rebuilding-rubble-fort-national>.

Beneficiaries

The primary catchment area of the Katye project was the area bounded by Avenue Poupelard, Avenue Martin Luther King, Avenue Nord Alexis and the ravine (hereafter referred to as the “five zones”). While the individuals in this area received a more comprehensive package of services, they reflect a fraction of the total project beneficiaries. 1,984 families directly benefitted from project activities.

Final enumerations suggest that there are 574 families (2,542 individuals) living within the five zones: Impasse 138, Robinson, Covington, Ravine Pintade, and Caravelle-Houblon. All individuals in this area benefitted from a comprehensive package of services, ultimately leading to a healthier, safer, and less vulnerable neighborhood with DRR and WASH infrastructure, water access and health services, rubble removal, housing repairs/t-shelter construction, etc. Initial estimates obtained from the municipality (MTPTC, Ministry of Public Works) suggesting that 905 families (6,335 individuals) lived in the area were found to be significantly overestimated.

In addition to the houses in the five zones, an estimated 1,410 families in surrounding neighborhoods benefitted directly. Both infrastructure and service provision extended beyond the five zones, as shown in the table below. In addition, all health, protection and WASH activities were open to the broader community. The table below provides a comprehensive picture of project beneficiaries.

Activity	Number of Beneficiaries Recorded	Number of families represented	Number of families not included in other beneficiary counts
Five zones (benefitting from all activities)	574 households	574	574
Housing demolition and rubble removal	806 households	806	232
Shelter repair, construction and distribution	586 households	586	0
Landowners who received free rubble clearance	243 plots	121	121
Cash for Work employment	2,311 employees	924	462
Patients to community health center	2498 first time visitors	833	417
Training participants	1,218 participants	406	102
Children who visited community center	607 children	303	76
Total number of beneficiary families			1,984

See Annex 4: Beneficiaries of the Katye Project for a more comprehensive discussion of beneficiaries.

Program Description by Sector

Sector: Shelter and Settlements

Objective: Create a community-driven, neighborhood-based approach to returning IDPs to neighborhoods that provides earthquake-affected households with healthy, habitable, and secure living space.

The Ravine Pintade area was devastated by the earthquake; best estimates suggest that 65% of households were destroyed in the earthquake (“red”) and an additional 30% were damaged (“yellow”). The degree of destruction left the community inhabitable. Rubble filled the zones and clogged access routes. Over the course of the project, the previously unplanned and highly vulnerable community was reconstructed. Through the construction of transitional shelters, Katye recovered 105%⁴² of lost housing units.

Sub-Sector: Emergency/Transitional Shelter

Indicator Table 1. Emergency/Transitional Shelter

	Indicator		Target ⁴³	Total Achieved	Percent Achieved
Indicator 1	Number of households receiving Emergency/Transitional shelter, pursuant to SPHERE standards and FOG guidelines	Total	284 ⁴⁴	386	136%
		2-story	50	126	252%
		1-story	234	260	111%
Indicator 2	Percent of total affected population receiving Emergency/Transitional shelter assistance		--	77% ⁴⁵	--
Indicator 3	Total USD amount and percent of approved project budget for Emergency/ Transitional shelter spent in the affected local economy		--	\$471,325	--
			--	57% ⁴⁶	--
Indicator 4	Number of square meters (m ²) of public space created from previously private plots		--	1,892	--
Indicator 5	Number of households agreeing to reduced plot size for additional shelters or public space		--	201	--
Indicator 6	Number of private lots re-shaped to create more public space		--	171	--
Indicator 7	Number of parcels in process of formalization with local government		--	0	--
Indicator 8	Number of community groups established to support settlement design and plot allocation		6	6 ⁴⁷	100%
Indicator 9	Percentage of settlement households who accept the new settlement design		--	X	--
	Total amount of rubble (m ³) removed from the site		35,000 ⁴⁸	32,531	93%

⁴² Figure explained in the subsequent section. In summary, the earthquake created a housing deficit of 366 units. Under the project, 386 housing units were replaced with temporary shelters. (386/366=105%)

⁴³ Targets for most indicators were not set at the onset of the project. These targets are not standard and not possible to evaluate before extensive mapping is performed.

⁴⁴ Technical proposal includes 50 two story houses and 234 one story houses budgeted for by CHF as well as an additional 400 to be provided by UN OPS at no cost.

⁴⁵ 386 households received t-shelters. Using the average household size in the zone (5.1), 1,969 affected individuals benefitted from shelters. The total population of the zone (2,542) is used as the denominator. If instead the total number of displaced persons (individuals in “red houses”) were used as the denominator the percent of total affected population receiving Emergency/Transitional shelter assistance would exceed 100%.

⁴⁶ The total Shelter & Settlement Budget is \$5.54 million, including rubble removal, construction site planning, and DRR activities. To estimate percent spent on t-shelters only, the denominator used here is the budget committed for t- shelters, including international procurement of steel shelters (\$320,000), for a total of \$820,000. This does not include the \$477,000 spent on RR and Transport, the \$212,000 spent on CFW, or the \$2 million on other construction contracts.

⁴⁷ One central planning committee (KCC) and five zonal committees each representing one of the project zones.

⁴⁸ Initial estimates of rubble (80,000m³), compiled prior to the inception of the KATYE project were amended during the fourth quarter based on more comprehensive mapping of the area. The target is reflective of current estimates of rubble in the zone at the time the project commenced.

	Number of individuals employed through Cash for Work projects	2100	2,311 ⁴⁹	110%
--	---	------	---------------------	------

Settlement Mapping: Technical and Participatory

At the time of the earthquake, very little information about the Ravine Pintade area existed. The government had neither detailed maps nor accurate census information about the area. The best information about the area came from a habitability assessment overseen by the MTPTC, information that proved to be inaccurate. To enable recovery of the area the following maps were generated:

Community Multi-Hazard Map: A geotechnical survey was completed in January, led by geotechnical expert Harry Clinton (former Minister of Public Works) and Fugro, the soil study firm. The study was tailored to local needs and constraints but observed basic seismic safety standards. The assessment collected basic geologic information, evaluated potential geo-hazards, developed International Building Code (IBC) seismic and foundation design parameters, and provided general site redevelopment recommendations for foundation parameters. These documents have been submitted to the Ministry of Public Works and the mayor of Port au Prince. In parallel, the Katye technical team worked with community members to map local knowledge of hazards. Information compiled from the community regarding drainage patterns, areas damaged or vulnerable to flooding and landslides, electrical hazards and other risks were added to information from the technical assessment to form a comprehensive multi-hazard map. The map was used to help select appropriate shelters and plan the position of retaining walls, drainage line, and other DRR infrastructure. GPS data was collected but GIS maps were not developed, a result of limited local GIS capacity at the onset.

Digital topographic Contour Map: The topographic survey and parcel mapping, bid out to the firm Metric, did not conform to the reality on the ground. While yielding much valuable information on the site such as terrain slopes, the data was incomplete. In addition to the inherent complexities of mapping an informal community, the firm was unable to identify the land plots of homes cleared prior to the survey. Additionally, structures were often too close together to allow the use of surveying instruments. Clusters of structures were often invisible from the outside, concealed beyond narrow paths. It became evident that this external firm was not able to engage the community to combine their knowledge of the pre-earthquake landscape with information from the existing physical terrain. An estimated 130 shelters (of 275 later identified) were missed in initial mapping. To rectify the situation, the Katye team took over the process. In teams of three, a professional engineer and two individuals from the community, outlined each dwelling, recording, and enumerated individuals not in the existing database. Using urban planners from CHF's team in India, the team used a combination of photos, ground measurements, and drawings to create an AutoCAD representation of the zone for planning purposes. The information was used to generate current hazard maps, land parcel maps, drainage and circulation maps, and mitigation maps.

Multipurpose Cadastre (MPC): A multipurpose cadastre was developed over the course of the project by the CHF team and was used to manage cadastral and basic socio-economic data. The first formal, comprehensive cadastre of the area was developed through a participatory land verification process and comprehensive enumeration, described in more detail in the Methods section above. The Katye staff mapped each parcel/plot based on its size, location, and level of damage/feasibility of construction; all information is contained in the database.

Collectively these maps were used as the basis for recovery activities and participatory planning. Detailed mapping and information enabled micro-level solutions targeted to the specific needs of each zone.

Participatory Planning and Community Consultation

⁴⁹ A total of 2,311 unique individuals were employed through CFW programs. Many individuals worked more than one pay cycle. Over 5,000 positions were created.

Ravine Pintade was formed amorphously and over time developed a layout that had no defined pattern.⁵⁰ To lay the foundation for a more formalized community, project technical staff worked with community members to develop a new plan that met the needs of all residents and reduced vulnerability. To assist with community planning, a central planning committee (Katy Central Committee – KCC) composed of individuals from each of the five zones was created to represent the community. As designed, the committee consisted of members of each of the five zonal committees who supported the KCC. In practice, these zonal committees proved to be very strong. Each of the five zones had unique needs and functioned somewhat autonomously; the zonal committees were better able to represent these needs. Each committee was composed of 5-7 leaders/notables elected by the community. These leaders facilitated the planning process which involved representatives from each family, facilitating discussions with the community to develop universally accepted site plans.

Together, this team of community members and Katye staff used information from geotechnical and hazard information as well as community maps to develop new plans. The plans, complete with the location of each individual shelter, planned road and footpath, DRR infrastructure, and latrine, were presented to municipal authorities and the communities. Construction began when all stakeholders signed off on the plans.

Input from the community was fundamental in ensuring project objectives were appropriate, practical, realistic and achievable. The process required flexibility and cooperation; land plots had to be redrawn and in some cases reduced to make room for public infrastructure, improved circulation, and ensure all households had a minimum 12m². Land is a scarce and valuable resource in this zone which community members were reluctant to give up. Katye mobilizers and community leaders worked to rearrange the community, negotiating each inch of land with the relevant land owner. Ultimately, 201 households agreed to reduce their plot size to make room for an additional shelter or public space, and 171 households agreed to re-shape their plots to create public space. Each negotiation was a long, participatory process.

Land Tenure and Parcel Verification

Extensive work at the beginning of the project to collect existing land tenure documents yielded nothing. CHF teams made visits to Haiti's land title registry housed at the Direction General des Impôts (DGI) as well as local notaries. Neither process presented useful verification of land rights. In some cases residents had documentation but 44% of responders had no proof of ownership or rental documentation. Of those with no land ownership status, 77% set up their structures on empty land, belonging to either the state or an unknown property owner. Another 13% claimed they are staying on a piece of land with the owner's permission, typically arranged through familial or social connections. Further complicating things: there was almost an equal number of people who owned land [by purchase (21%) or inheritance (17%)] as those who rent land (35%).

Given the lack of formal documentation, a standardized process of determining land ownership using local knowledge was developed. Households were said to have a right to the land if (1) the head of house, (2) 3 witnesses/neighbors, and (3) the community committee all agreed it was *and* (4) no one else objected. Using this system, a living cadastre of the area was developed and approved by the community committees. Copies of all agreements were provided to the community committees at their request to enable them to ensure the documents are upheld beyond the life of the program.

To assist in the formalization of the community, CHF engaged government stakeholders to legitimize the land tenure agreements and documentation of parcels obtained through a community participatory method. The cadastre has been provided to Comité Interministériel d'Aménagement du Territoire (CIAT) and the mayor of Port-au-Prince. CHF has worked with each entity to determine the steps necessary to formalize settlements. It was suggested that

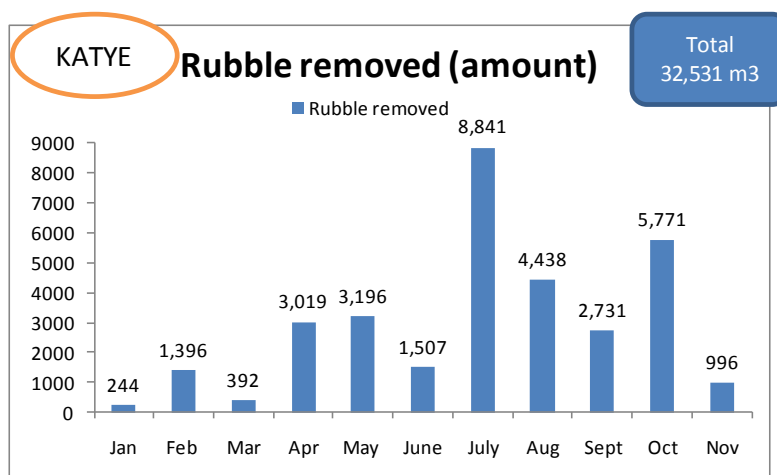
⁵⁰ Geotechnical assessments suggest that the area was mostly underdeveloped prior to 1991 after which rapid and dense residential development occurred throughout the entire Katye site.

Ravine Pintade could be used as a pilot for the government for formalizing undisputed land plots. Yet, at the end of the project, no system for formalization exists.

Site Clearing and Rubble Removal

Rubble removal of key arteries, access routes, the ravine and a school began immediately. Once the participatory mapping had begun and property boundaries identified, the clearing of smaller structures began. The delay was fundamental to accurately mapping the pre-earthquake situation and ensuring that recognized property lines would be respected, a key concern of land owners.

Rubble removal was critical in creating a safe corridor into the community as well as to clear space to enable recovery of the community such as t-shelter construction. Both heavy equipment and CFW were used in order to appropriately clear areas for construction. Along these cleared access areas, CHF used heavy machinery to begin the demolition and clearing of major service points such as schools and clinics as well as larger red houses and structures that impeded access to other, more clearable sites. The community, equipped with whistles, rope, tape and vests, played a key role in ensuring safe movement of heavy machinery. Work on the interior of the project was more logistically difficult given the congestion and inaccessibility. Most work on the interior required manual rubble removal.



It was initially estimated that the site contained about 100,000 m³ of rubble to be removed, and that approximately 80,000 m³ or 80% of rubble and debris would be removed through the Katye program. Following more comprehensive mapping, the total rubble amount was amended to 35,000 m³. Of that, 93%, or 32,531m³, was cleared. The remaining rubble was on private property and owners requested it not be cleared.⁵¹

Rubble removal also played an important role in stimulating the economic. Community members were engaged in CFW activities and ensured safety of mechanical removal. Three of four households (73%) in the Ravine Pintade neighborhood had at least one family member employed through CFW activities. Additionally many individuals from neighboring zones were also employed, extending the benefit of the project. Over the course of the project, Katye injected \$537,467⁵² into the community through CFW alone, providing jobs to 2,311 individuals. Given the impact of the earthquake on livelihoods—only 13% of individuals in Ravine Pintade were formally employed at the start of the project—access to work was the primary concern of most households. Katye staff documented many cases of individuals reporting they returned to the community because they had heard CFW activities had begun.

⁵¹ Owners of larger plots requested the land not be cleared given a concern that cleared plots would attract squatters.

⁵² This total includes CFW for rubble removal as well as construction of shelters and other activities (WASH mobilization and education).

The Katye project took important steps to eliminate the risk of extortion, corruption and sexual exploitation. Payment for CFW was managed by a local bank (Unibank) which had an independent system for verifying the identity of an individual to ensure the worker and the recipient of funds are the same. Attendance lists compiled by the Site Supervisor as well as a photocopy of the identification card for each individual was used by the bank to make vouchers. The bank electronically tracked the vouchers and date of distribution in an online system enabling verification by Katye. This system avoided payment on site and created a system with numerous quality checks. In addition to this, all individual participating in CFW were trained in Gender Based Violence and Exploitation. The training covered the zero tolerance policy and methods of anonymously reporting corruption. In addition to the independent reports, the Katye staff conducted private, random interviews aimed at identifying cases of corruption/extortion as well as child labor.

Transitional Shelter Construction

To re-shelter all displaced persons a combination of approaches were taken. Houses that were damaged were repaired and destroyed homes were replaced by either one- or two- story t-shelters. Using this model, 505 physical shelters were constructed or repaired providing shelter to 596 households. The following table has a break down by type.

	<u>Proposed:</u>	<u>Actual:</u>
One Story T Shelters : CHF	234	110
One Story T Shelters: Partner ⁵³	400	150
Two Story T Shelters : CHF	50	75
Repaired Homes: PADF/Miyamoto	153	170
Total T-shelters:	837	505

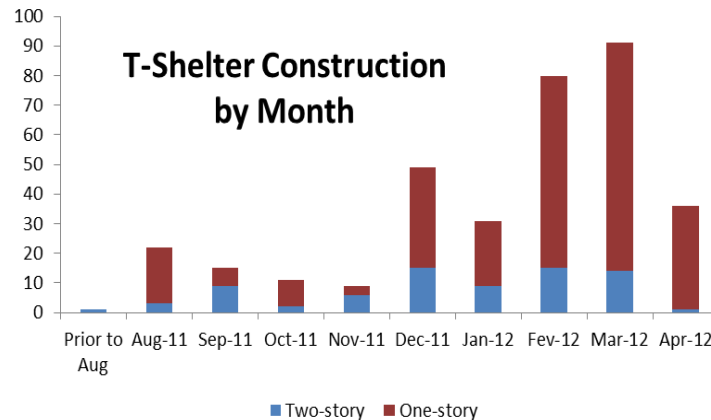
CHF identified houses that were habitable and amenable to repair (“yellow” houses). The initial habitability assessment conducted by MPTC identified 153 yellow houses. The Katye technical team’s subsequent evaluation reclassified some of the homes amending the number to 170.⁵⁴ CHF coordinated with Miyamoto and PADF to repair all of these homes. Repair of homes proved to be the quickest and least expensive way of providing shelter. The cost per repaired home was \$1,500, less than half that of the t-shelters and all repairs were completed before the first t-shelter was finished.

In cases where the earthquake destroyed the house beyond repair, the house was demolished and replaced with a t-shelter. It is estimated that 386 families in the five zones previously lived in “red” housing units. Of the 386 families, 20 chose to repair and remain in their original homes. By this calculation, the earthquake created a housing deficit of 366 units. Under the Katye project, a total of 260 single-story t-shelters and 75 two story t-shelters were constructed, of which 51 were shared as two units by two families. These shelters have enabled Katye to rebuild 105% of lost housing units.

The Katye project used pre-fabricated shelters to ensure high standard quality and also to speed the process of distribution and construction on the shelter sites. At the peak of construction, teams were able to erect t-shelters in less than two days. In March, 91 t-shelters were constructed, nearly 4 per work day.

⁵³ Proposal includes commitment of 400 shelters from UNOPS, which did not deliver. Shelters (150) ultimately funded by Cordaid.

⁵⁴ Of the 170 repaired houses, 129 fell within the “Katye catchment area”



Two types of shelters were used in the project:

- Wood-frame, one-story transitional shelter** - Made of plywood walls and a corrugated tin roof, the model is resistant to hurricanes (up to 100mph winds), seismically safe and treated to resist termite damage. The design is module and can be adapted to different size plots (12m² to 18m²). These structures are temporary, intended to last 1-2 years, but amenable to incremental development. With further investments from the families, these structures can serve as the foundation of a semi-permanent structure. These structures were designed by Cordaid. Of the 260 constructed, 150 were built by Cordaid with their own funds and 110 by CHF.
- Two-story steel-frame transitional shelter** – To enable more re-settlement in high density areas, CHF constructed two-story t-shelters. The two-story T-shelter has a floor area of 2.9m x 4.1m or 11.89 m² with an exterior staircase to reach the second floor. Seventy-five two-story shelters were installed, 24 to beneficiaries that demonstrated their households were large (6-10 people) or committed to hosting family members who have also been displaced. The majority (51) are occupied by two families; either two adjacent land plots were small (less than 12m²) and combined to provide more space to both families or the house on the property was two stories before the earthquake and used as by the land owner as a rental property.

The shelter program worked on a rotating basis to ensure that shelters were not constructed before planning was complete, did not block access to other areas that need to be cleared, and enabled construction of shelters to begin quickly. The Impasse 138 zone was the smallest of the zones. As a result, it was relatively easy to map and clear. Construction in this zone began first. Seeing the transformation in Impasse 138 garnered trust; people began to believe that Katye would actually build the planned communities, a reality that made participatory planning easier in other zones.

While shelters were being repaired or constructed, on-site relocation was made available. “Hotels”—emergency shelters constructed by Katye —were built on site for temporary housing to be used for families displaced by construction work. In addition, the zonal committees helped find families or friends to host families. The zonal committees were so resourceful in finding temporary hosting solutions that for most of the project the hotels were not needed. With the help of community leaders, most families were hosted near or in the project site.

Sub-Sector: Shelter Hazard Mitigation

Indicator Table 2. Performance Indicators for Shelter Hazard Mitigation

	Indicator	Target	Total Achieved	Percent Achieved
Indicator 1	Number of shelters incorporating hazard mitigation measures	437	505 ⁵⁵	116%
	Shelter (2-story)	50	75	150%
	Shelter (single story)	234	260	111%
	Shelter (repaired)	153	170	111%
Indicator 2	Number of settlements adopting hazard mitigation measures	1	1 ⁵⁶	100%
Indicator 3	Number and percentage of people retaining shelter hazard mitigation knowledge two months after training	--	274 ⁵⁷	--
		--	N/A ⁵⁸	--

Disaster Resistant Shelters

The shelters designed by Cordaid were designed to be earthquake, hurricane and termite resistant. Relative to traditional materials, wood frames may act more flexible in an earthquake and therefore are more resilient. To mitigate against hurricane damage, the wood frame is anchored in blocks of solid cement. Hurricane straps secure essential connections. The roof design is calculated to withstand wind speeds of 108 mph (174 kmh). Additionally, the wood is pressure treated to protect against hazards. It is expected to last at least 15 years.

To ensure improved shelter construction beyond the life of the project, Build Change trained 50 homeowners in safer and better construction practices. The two sessions hosted by Build Change provided community members with information on safer building practices. The training followed the geotechnical survey and provided households on safe land that were willing and able to rebuild the knowledge to do so.

Disaster Risk Reduction Infrastructure

Beyond building safer shelters, efforts were taken to reduce the vulnerability of the community to natural disasters. The following section documents the DRR infrastructure built in the community to lay the foundation for a more resilient neighborhood. The infrastructure was built by Haitian firms who were encouraged to hire 1,210 individuals living in the zone. They found that the capacity existed locally. Experience building at standards in accordance with international codes builds local capacity for high quality incremental development of the zone.

Drainage for Landslide and Flood Mitigation: The geological assessment suggested that the terrain in the Katye zone, surficial soil and weathered upper bedrock, is susceptible to erosion. To mitigate the risk of landslides resulting from heavy rains, shelters needed to be protected from water pooling around the shelter foundations. Beyond erosion, heavy rain often caused flooding in the zone which damaged homes and increased vulnerability to water borne infections. To mitigate these risks, 2,357 linear meters of drainage canals were built. Pathways throughout the community have drainage grates connected to piping that enables water to flow into the ravine at the base of the community using gravity. The subsurface drainage system is integrated into the retaining walls.

⁵⁵ All shelters installed or repaired in the project are resistant to earthquakes, hurricanes and termite damage.

⁵⁶ For the purpose of this indicator, all five zones were defined as one “settlement.”

⁵⁷ Figure includes the 50 homeowners trained by Build Change and 7 trainings on DRR benefitting 224 individuals.

⁵⁸ The majority (82%) of the trainings on hazard mitigation were completed during the final quarter of the project. As such it was too early to measure knowledge retention.

Drainage grates are covered with metal mesh to allow for water to pass but prevent garbage and other materials that may clog the system. In addition to designing aspects aimed to sustainability, DRR trainings focused on ensuring the protection of DRR infrastructure including the drainage systems. Over the course of the project, the Katye team led 7 trainings focused on DRR infrastructure maintenance.

Retaining Walls for Soil Retention and Earthquake Mitigation: Ravine Pintade is a V-shaped valley. The elevation differential across the site ranges from 100 meters to 65 meters in the ravine creating steep slopes. Over the course of the project, 2,410 ml of retaining walls were built. Retaining walls stabilized the slope and held back earth which previously slid during heavy rains and was a hazard in the earthquake.⁵⁹ Retaining walls were integrated with the drainage system to alleviate hydrostatic pressure. In addition to their DRR role, the retaining walls created additional space at each elevation. This new space enabled the creation of more public space used primarily to widen pedestrian pathways to improve circulation.

Street Rehabilitation for Circulation and Access: Three major access roads were cleared of rubble and repaved: Avenue Robinson, Covington, and Caravelle-Houblon. Collectively they constitute 465m². The figure does not include the repairs of dozens of smaller pedestrian passageways repaved throughout the interior of the community. Repaired roads are important for DRR as they protect against flooding and would ensure quick access for ambulances and search and rescue teams. They also reduce vulnerability by improving the flow of people and reducing overcrowding.

Street access has also had an economic impact on the community. With more pedestrian traffic through the community, the market along the ravine has seen increased business. Repaired roads have encouraged municipal garbage services (SMCRS) to pass through the area and have enabled water trucks to access the water points constructed in the project. Public transportation (tap taps) now pass more frequently via the repaired roads. Increased access to waste, water and transportation services has changed the quality of life in the community.

Sector: Water, Sanitation and Hygiene

Objective: Facilitate access to essential public services through cooperative planning with local stakeholders and community members

Even before the earthquake, Haiti lacked public sewage and wastewater treatment systems. Existing infrastructure was generally damaged, exacerbating impacts on environmental conditions and health risks associated with morbidity and mortality from water and vector borne diseases. This posed serious hazards particularly during rains in Port au Prince; the existing infrastructure directed rain and waste water into low lying neighborhoods such as Ravine Pintade which lacked adequate drainage. In regards to sanitation, more than a third (38%) of people surveyed did not have household latrines and most lacked bathing facilities—among them, most reported showering in the streets and/or without access to privacy. There were no communal hand-washing facilities available and household drainage was non-existent, creating pools of standing water around living areas. Waste management was also poor; 85% of respondents disposed of their trash inappropriately, including in ravines, on the street, and in other public areas.

The following sections document the activities aimed at improving the water, sanitation and hygiene quality in the Ravine Pintade area. For each sector, education and community mobilization were coupled with infrastructure improvements. The demand created for improved sanitation helped ensure the high adoption of infrastructure and ultimately led to reductions in morbidity and mortality.

⁵⁹ The geological assessment found no evidence of earthquake-induced ground failure from surface fault rupture, landslides, or liquefaction. Yet while no earthquake-induced landslides existed, the terrain of the community created a risk of landslide that may have been exacerbated by the earthquake.

Sub Sector: Sanitation

Indicator Table 3. Performance Indicators for Sanitation

	Indicator	Target	Total Achieved	Percent Achieved
Indicator 1	Number and percentage of latrines completed and in use in compliance with SPHERE standards	873	140	16%
		100%	100%	100%
Indicator 2	Number and percent of household hand-washing facilities completed and in use	850	479 / 100% ⁶⁰	56%
Indicator 3	Number and percentage of households disposing of solid waste appropriately	850	132 ⁶¹ / 23.0%	16%

Given the height of the water table and density of the population in the catchment area, technical assessments suggested that latrines were not an adequate method of managing sanitation in most of the zone. As an alternative, an improved sanitation system was integrated into the urban plan.⁶² 111 pour flush toilets were installed: 34 individual toilets and 77 toilet blocks. Individual toilets were installed where space permitted. Each toilet block has a shower station and is shared between 2-3 families. Bucket flush toilets were connected to a drainage system feeding into 1,000 gallon pre-fabricated plastic or fiber glass septic tanks underground. Soak pits were installed near septic tanks to accommodate overflows. In most cases each septic tank/soak pit combination served two or more sanitary blocks.

In addition, 29 elevated pit latrines were installed in areas immediately adjacent to the ravine for the following reasons:

- 1) These sites represented the lowest points in the area with no downhill neighbors who would be endangered by seepage from latrine pits.
- 2) High water tables resulting from flaws in the lining of the ravine filled soak pits and floated septic tanks to the surface.
- 3) The future of settlements along the ravine banks was uncertain given stated public policies barring residential use in such locations

An estimated 281 households (49% of the all households in the five zones) are served by the toilets and latrines installed during the project. This figure does not include households that already had access to toilets prior to the project (households in green or yellow houses). Total access in the area is now nearly universal.

Installing flush toilets in a community accustomed to latrines and open defecation required extensive mobilization. Prior to installation of each toilet block, the families sharing the block received group training on how to use and maintain the toilet. Katye staff facilitated discussions on the logistics of sharing the facility. For example, cleaning proved complicated. Some households are rotating cleaning on a daily or weekly basis. Some are pooling funds to pay for someone to clean the facility. To support appropriate maintenance, bleach and other supplies for disinfecting areas around latrines were distributed to all families. In most cases families installed a lock and each family keeps a copy of the key.

All toilets (individual and shared) also have a shower station and each shared toilet has a public hand washing station. Both shower and hand washing stations feed into the community drainage system. In addition to the public hand washing stations, 479 household hand washing stations were distributed. While simple, these structures were

⁶⁰ To assess the percent of household hand-washing facilities currently in use, a sample (200) of all households were visited. Of households visited, 100% were using the facilities.

⁶¹ Figure taken from household assessment (n=74) and extrapolated assuming 574 households in the KATYE catchment area.

⁶² Funding for the sanitation systems is from Johns & Johnson

covered and had spigots which helped prevent contamination. The final evaluation suggests that 62% of households kept soap near their hand washing station suggesting regular hand washing with soap and water.

Improved waste management was an important DRR tool for vector control and preventing blockage of drainage systems. Initial efforts at waste management proved unsuccessful. Large bins were stolen, and smaller trash buckets were used to store water. The Katye team worked with the community on an improved approach. Smaller, less valuable public waste buckets with holes to make them unsuitable for other uses were designed. The completion of key roads in the project site and continued negotiation with the Solid Waste Metropolitan Collection Services (SMCRS) ultimately convinced the agency to provide biweekly collections in the community. Regular SMCRS pick ups have encouraged individual families to collect waste (in bins distributed by Katye) and bring them to the SMCRS trucks.

Regular SMCRS truck routes and the installation of community bins were first realized in February 2012. Consequently, behavior change has not yet been realized; as of February, only 15% of households reported disposal of waste in public or community bins. If SMCRS continues to abide by this regular waste pick up, the existence of more waste bins coupled with significant awareness-raising on the health consequences of waste should lead to behavior change.

Sub-Sector: Hygiene Promotion

Indicator Table 4. Performance Indicators for Hygiene Promotion

	Indicator	Target ⁶³	Total Achieved	Percent Achieved
Indicator 1	Percent of target population demonstrating good hand washing practices	75%	99% ⁶⁴	132%
Indicator 2	Percent of target population demonstrating correct water usage and storage	100%	89% ⁶⁵	89%
Indicator 3	Number and percent of water points functioning three months after completion	3 (100%)	5 (100%) ⁶⁶	167%

From the initial phase of its activities, Katye emphasized awareness-raising and community education to address issues related to poor hygiene. By the end of the project, Katye reached approximately 96%⁶⁷ of households during home visits aimed at improving knowledge of appropriate hygiene and sanitation activities. Working at the household level, mobilizers were able to break down some of the stigma surrounding hygiene and sanitation and work directly with individuals to take small steps to improve unhealthy behaviors. Household level education and mobilization was led by 176 community members (teams of 44 community members rotated every 3 months and paid through CFW activities) and supervised by Kayte WASH staff. The 176 community members received a comprehensive WASH training which covered storage and treatment of drinking water at the household level, testing for the presence of

⁶³ All targets in this table based on total achieved during OFDA funded Haiti Earthquake Recovery Program (Agreement #: DFD-G-00-10-00093-00)

⁶⁴ Data taken from household assessment (N=365) performed in February. "Good hand-washing practices" is defined as reporting washing hands proceeding/following at least two of the following activities: cooking, eating, breastfeeding, using the toilette, and cleaning a child. Assessment found that on most people washing hands before cooking (88.6%), after using the toilet (99.4%) and before eating (98.9%).

⁶⁵ Data from household assessment (N=365) conducted in February. "Correct water storage" is defined as purifying water using any modern method and keeping drinking water stored correctly (covered).

⁶⁶ Three water points completed in final months of the project. While they are currently in operation and have been functioning since completion, three months has not yet passed to accurately assess this. 100% refers to the two water points completed by December 2011.

⁶⁷ Number assessed through a household survey ("Willingness to Pay Evaluation in September). 150 houses were sampled (99% Confidence, CI: ±10).

coliform and chlorine, hand washing, personal hygiene and hand washing, latrine sanitation and maintenance and other hygiene practices.

In addition to these home visits, 68 trainings on hand washing, water purification, latrine management, personal hygiene and other WASH topics were conducted. Community level education included a series of 68 training sessions attended by 833 unique individuals. A full list of trainings, discussions and education sessions is available in Annex 5.

The approach used is founded on similar principles to the Participatory Hygiene and Sanitation Transformation (PHAST) training in that the underlying basis for both approaches is the notion that sustainable change in people's behavior depends on understanding and believing. Evidence-based, participatory process methodology helps ensure the sustainability of the progress. The WASH team has adopted many of the PHAST tools. As an example of this methodology, PCI training on water treatment and appropriate water storage achieved success when field-based fecal coliform testing was introduced. Over the course of the project, community members trained in using coliform test kits have gone house to house testing drinking water. The dramatic results of the test—water turns a deep black if positive for coliform—has helped encourage community members to treat their water. Seeing the black water helped people visualize and understand water contamination, making them more receptive to the training. Currently only 1% of households tested positive for coliform bacteria exceeding 0 per 100 ml, a significant decline from 34% measured in April 2011. To achieve sustained behavior change, this method required returning to households that tested positive and working with them on proper water purification and storage methods. Households were also revisited quarterly to ensure behavior change was sustained over time, especially as the immediate threat of cholera became more distant.

Distribution of hygiene kits with tablets for purifying water (Aquatabs), soaps, buckets, bleach and other hygiene supplies and information helped equip communities with resources to maintain sanitation and prevent the spread of cholera. Education and mobilization campaigns achieved great success in educating the population on the needs for treating and covering water, washing hands and other behaviors associated with good hygiene. Yet, given the economic situation of families living in Ravine Pintade (28% living on \$1/day), many cannot procure all of the materials they have learned are necessary for improved sanitation. Hygiene kits were distributed to all households in the five zones and many in surrounding neighborhoods.

Hygiene Kit distribution by item, cost and estimated beneficiaries

	Units	Unit Cost	Total Cost	Total Families Reached
Soap ⁶⁸	4,100	\$0.50	\$2,050	1,367
Aquatabs ⁶⁹	28,400	\$0.02	\$4,760	1,420
Oral Rehydration Solution ⁷⁰	1,800	\$0.39	\$693	600
Water Buckets ⁷¹	1,679	\$7.50	\$3,593	560
Waste Buckets	567	\$7.50	\$3,969	567
Estimated Total	22,146	\$15.78	\$14,372	1,420⁷²

⁶⁸ 3000 donated by Commission Interiminaire de Sante, 1000 donated by IOM, 100 donated by Americares. Distributed in kits as well as subsequent distributions (3 per household).

⁶⁹ Each household received 20 aquatabs (2 packages of 10).

⁷⁰ Each household received 3 packages of ORS.

⁷¹ Most households received 3 buckets (all with lids and spigots to avoid contamination).

⁷² Materials were delivered as a kit (with remaining soap and aquatabs delivered more broadly). As a result, line items contain significant duplication. It is assumed that 1,420 unique families received the hygiene kits.

As a result of the hygiene education and distribution of hygiene kits, by the end of the project significant behavior change was achieved. As illustrated in the following table, significant improvements were witnessed in target behaviors.

WASH Behavior Change

	Pre-Katye ⁷³	Post-Katye ⁷⁴	Percent Change
Wash Hands Before Cooking ⁷⁵	50.2%	88.6%	76.57%
Wash Hands Before Eating	50.2%	99.4%	98.07%
Wash Hands After Using the Bathroom	13.3%	98.9%	643.31%
Treat Water Using Any Modern Method	96.7%	95.5%	-1.24%
Store Water in Covered Container	84.6%	89.4%	5.67%

Sub-Sector: Water Supply

Indicator Table 5. Performance Indicators for Water Supply

	Indicator	Target	Total Achieved	Percent Achieved
Indicator 1	Number and percent of household water supplies with 0 coliform bacteria per 100ml	850 (100%)	570 ⁷⁶ / 99%	99%
Indicator 2	Average water usage of target population in liters per person per day prior to and after interventions	15L	17	113%
Indicator 3	Number and percent of water points with measurable chlorine residual exceeding 0.2 mg/l	3 (100%)	5 (100%)	167%

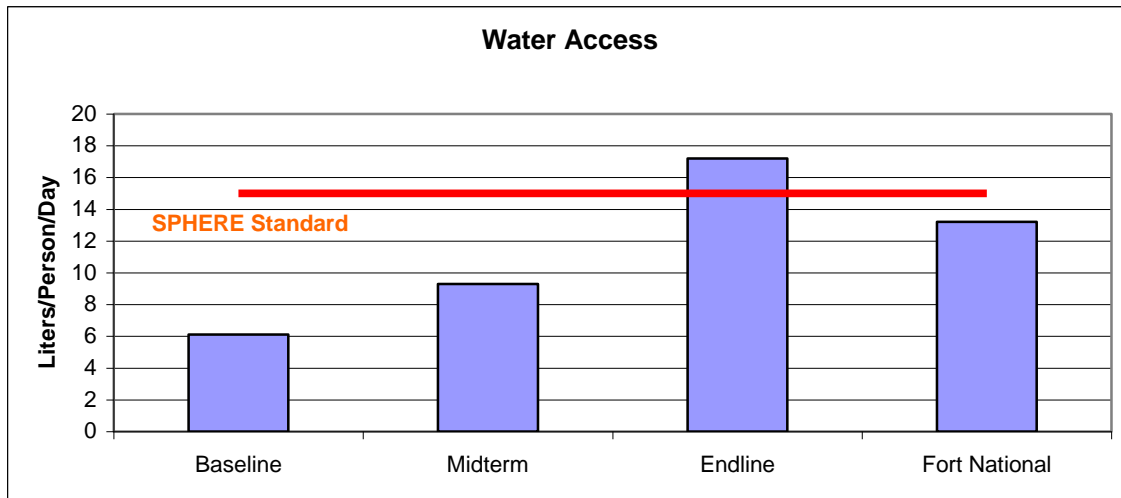
The Katye project achieved significant improvements in water quality and access through infrastructure improvements, targeted education and coordination with municipalities. Today, average water usage in the community is 17.2L per person today. This represents a 182% increase from baseline (6.1L/person/day). It is also a significant quantity relative to water access in neighboring communities (13.2L/person/day). Further illustrating the improvements in water access, the percent of people with a water supply meeting SPHERE standards (15L/person/day) has increased from 24% to 40% over the course of the project.

⁷³ Figure from 14,000 household survey conducted by PCI in 2010. Population surveyed includes the KAYTE catchment area as well as surrounding neighborhoods. Respondents asked about pre-KATYE hand washing behaviors in final evaluation; numbers not shown given suspicions of significant recall bias.

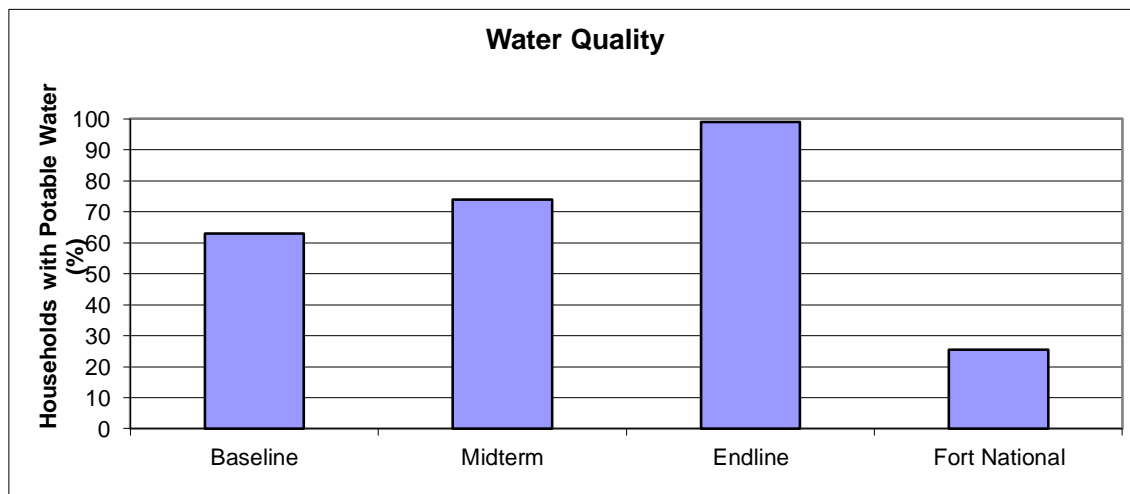
⁷⁴ Data from household assessment (N=365) conducted in February 2012.

⁷⁵ Pre-KATYE assessment assessed hand washing before cooking and eating together. Post KATYE measured each separately.

⁷⁶ Figure taken from household assessment (n=301) and extrapolated assuming 574 households in the KATYE catchment area.



In addition to improvements in access, quality has increased. As mentioned above, 99% of community residents now have potable water as measured by fecal coliform presence. This reflects an improvement from the baseline (63%) and relative to neighboring communities (25%).



These improvements in water quality and access were achieved through a combination of infrastructure improvement and education campaigns described in the following sections.

Public Water Infrastructure: Water Points

Much of the WASH infrastructure that existed before the earthquake was damaged or destroyed. Water lines that ran along Avenue Poupelard to the north and Alexi Nord to the west were previously connected to a distribution network supplying privately managed water kiosks. This network was abandoned prior to the earthquake due to the high number of illegal hookups; the infrastructure was subsequently damaged in the earthquake. Under the Katye project, five permanent water points have been erected. Water points have enabled community committees to deliver enough potable drinking water to all residents of Ravine Pintade to meet their minimum daily needs. The water points are a great improvement from the water bladders the community was dependent on after the earthquake. The water points are also more formal, seismically safe, and equipped with 3000 gallon tanks which supplies water to significantly more people. While currently filled using water trucks with reverse osmosis treated water, the water points are

designed to be compatible with municipal water supply lines once regular water supplied by DINEPA becomes available. To address the systematic issue of illegal hookups and ensure sustainable access to water, Katye staff worked in partnership with CAMEP and DINEPA. The director of CTE (a branch of DINEPA) visited the project site and met with Katye engineers and is working to connect the water points to the municipal water supply.

One water point was installed in each zone. Each is managed by a team of 5-7 community members. The committee manages the logistics of filling the tank, distributing water, and maintaining the water point. The first 3000 gallons of water were purchased with Katye funds. All subsequent procurements were made by the community using these profits. They have also received both trainings in WASH topics as well as training on finance and administration. Initially, water quality was tested by engineers. Committee members have since been trained on using the coliform/chlorine field tests and now manage the process of ensuring adequate water quality. At no point in the project have chlorine levels in the water points dropped below adequate levels (0.2 mg/L).

Given a total cost of \$20,045, supplying water to the community costs an estimated \$5.28 / beneficiary. Yet this amount is dwarfed by the average savings per beneficiary \$16.22 / year.⁷⁷ At the community level, it is projected that the community will earn over \$45,731 annually from the sale of water and collectively save \$61,651-\$137,924 per year.

Public Water Infrastructure by item, cost and estimated beneficiaries

	Units	Unit Cost	Total Cost	Total Reached
Materials	5	\$3,365	\$16,825	--
Labor	5	\$600	\$3,000	--
First Water Truck (3000 gallons of water)	5	\$44	\$220	--
Estimated Total	5	\$4,009	\$20,045	3,800

Community Profits from Public Water Infrastructure

Gallons of water per truck	3000 Gallons
Buckets of water per truck	600 Buckets
Revenue @ 5 HTG per bucket	3000 HTG (\$73.17 USD)
Expenditure per truck	1750 HTG (\$42.68 USD)
Net expected profit per truck	1250 HTG (\$30.49 USD)
Net expected profit per year ⁷⁸	1,875,000 HTG (\$45,731.71 USD)

Household Savings from Public Water Infrastructure

	Household (Per Week)	Household (Per Year)	Community (Per Year) ⁷⁹
Baseline Expenditure	\$4.90	\$254.80	\$193,648.00
End-line Expenditure	\$3.34	\$173.68	\$131,996.80
Actual Average Savings⁸⁰	\$1.56	\$81.12	\$61,651.20

⁷⁷ Calculation based on average savings per household / year (\$81.12) and assumes an average household size of 5.

⁷⁸ Currently the committees purchase a truck of water ever day or every other day. This calculation estimates 300 trucks per water point per year.

⁷⁹ The calculation of community expenditure and savings assume 760 households; the water point serves 3800 individuals or roughly 760 households (assuming an average household size of 5).

Projected Expenditure:

Assuming Total Quantity of Water Purchased at

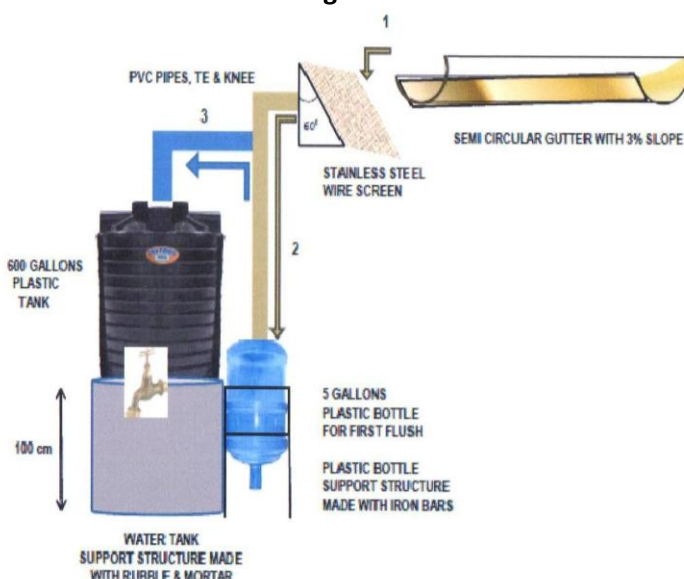
Katy Water Points⁸¹

	\$1.41	\$73.32	\$55,723.20
Projected Average Savings	\$3.49	\$181.48	\$137,924.80

Private Water Infrastructure: Rain Catchment Systems

In July 2010, PCI developed a rainwater harvesting and storage design tool. The tool facilitates an accurate understanding of the expectations of limitations of water harvesting systems associated with transitional shelters and repaired homes in Port-au-Prince. The interactive tool allows users to input rain water data (or utilize the data provided for Port-au-Prince by the Government of Haiti and the BBC), adjust the size of the roof and the harvest coefficient of the roof area, adjust the assumptions for desired water per person/ per family, and it will calculate the size of the storage capacity required. Based on the tool, rainwater harvesting was accepted by the Government of Haiti as an accepted method of gathering water in Haiti.

Rain Water Catchment Design



Using the tool, a water harvesting system was designed and installed on 300 shelters (90% of all houses constructed during the Katye project).

As illustrated to the left, the system is simple and designed with locally available materials. Water captured in a simple semi-circular gutter flows into a PVC pipe. The 4 gallon plastic bucket is used for simple filtration of large particles. Water is stored in a 200 gallon plastic tank. A spigot on the tank allows for the use of water for cooking, bathing, hand washing and other household needs (excluding drinking). The tank is elevated by a base of cinder blocks. Households have all been trained on cleaning and maintain the rain catchment systems.

The model suggest that on the one story homes which have a roof size 4 x 4 m, assuming an average occupancy of 6 and a harvesting coefficient of 85%, the rain water harvesting system with a 200 gallon tank will ensure an annual harvest of 20.4m³/year (9.3 Lts/person/day).⁸²

Rain Water Catchment Mathematical Model

Roof width	M	4
Roof length	M	4
Harvest Coefficient	%	85

⁸⁰ Average savings may be underrepresented. Average water consumption increased as expenditure decreased reflecting an even greater average savings per bucket.

⁸¹ At the time of the February 2012 assessment referenced as "Endline" only 2 of the 5 permanent water points were constructed. Consequently, not all households were purchasing all water from the KATYE water points. This calculation is theoretical assuming all households were purchasing all water at 5 HTG/ 5 gallon bucket.

⁸² Data from Rain Water Harvesting model developed by PCI and presented to the WASH cluster in 2010. Model and report available as an annex.

Occupancy	Persons	6
Desired Consumption	Lts/person/day	9
Annual Consumption	m3/yr	21.96
	Lts/yr	21,960

		GoH	BBC
Cumulative Rain	mm/yr	1498	1353
Average Rain	mm/day	4.1	3.7
Potential Annual Harvest	m3/yr	20.38	18.41
Potential Available Consumption	Lts/person/day	9.30	8.40
Minimum Storage	m3	2.72	2.50
=	Gallons	600	660
Barrels	200	3.0	3.3
Tank W x L x H	M	1.31	1.36

At a total cost of \$146,100,⁸³ supplying rain water catchment systems costs an estimated \$97/beneficiary. Given the cost of water in the community (5HTG/gallon), this system is saving households an average of \$131 dollars a year.

Sector: Protection

Objective: Assure that the basic principles of protection are integrated at every level of settlement planning and management.

Sub sector: Child Protection

Indicator Table 4. Performance Indicators for Child Protection

	Indicator	Target	Total Achieved	Percent Achieved
Indicator 1	Number of people trained in child protection issues	300	362 ⁸⁴	121%
Indicator 2	Number of and percent increase in number of mechanisms/systems to report/refer child protection issues/cases	5	9 / 230% ⁸⁵	180%
Indicator 3	Number and percent of targeted children reporting an improvement in their sense of safety and wellbeing	25% ⁸⁶	57.86% ⁸⁷	231%

Children were among the worst affected in the January 12th earthquake. An estimated 750,000 were directly impacted and suffered from physical injury, psychosocial trauma, and loss of family members, homes and traditional

⁸³ Price includes materials (\$437 per system) and labor (\$50 per system) of all 300 rain water catchment systems.

⁸⁴ Including 198 males and 164 females; see table for details.

⁸⁵ PCI's assessment found that respondents could identify seven existing mechanisms to report child protection issues, compared to an additional 9 facilitated by PCI (2 health clinics, 2 safe spaces and 5 neighborhood committees).

⁸⁶ Target based on total achieved during OFDA funded Haiti Earthquake Recovery Program (Agreement #: DFD-G-00-10-00093-00)

⁸⁷ In the final evaluation, 57.86% of households with at least one child reported an improved sense of safety and wellbeing from natural disasters such as earthquakes and hurricanes. 49.03% of households reported an improved sense of safety and wellbeing with respect to violence and crime.

support systems. Protection issues were further exacerbated by the alarming numbers of youth who were out of school and at high risk for conscription into illicit activity. Over the course of the Katye project, an emphasis on children enabled an improvement in their overall safety and wellbeing. The initial assessment of children's protection⁸⁸ found that 49% often went without three meals a day; 75% were easily surprised (always or sometimes) and 52% of children under 6 were frequently scared. Discussions with parents and Child Friendly Space (CFS) monitors suggested that at the baseline many of the children were still experiencing difficulty coping with the trauma of the earthquake. With respect to these measures, at the end of Katye, 58% of households reported that their child had an improved sense of safety and wellbeing.

The initial assessment of the mental and physical health of youth (aged 7-18) found that 76% of youth never feel safe at school and 83% never feel safe at home. By the end of Katye, nearly half (49%) of households with children under 18 reported that their children felt safer with respect to violence and crime. As an additional measure of child wellbeing, enrollment rates suggest a return to normalcy. At baseline, only 45% of children in surveyed households were attending school. By the end of this project, school enrollment had increased significantly. As of February, 87% of children of school age were attending school.

These results were achieved using a community-based approach that reinforced safe and nurturing environments for children while reestablishing basic services to support their well-being. The four-pronged strategy included: (i) the construction of neighborhood safe spaces where children are engaged in daily activities; (ii) the capacity building of local institutions that can provide protection services, such as schools and churches; (iii) training the community on child protection; and (iv) mainstreaming approaches to facilitate children's protection in all sectoral activities.

Construction of Neighborhood Safe Spaces

In collaboration with local neighborhood committees, two spaces were identified for the establishment of a child-friendly space for children under 15 and a youth center for 15-25 year olds. The CFS provided regular activities for more than 701 vulnerable children. During the summer months, the CFS received over 100 children per day. The youth center provided regular activities for 25 at-risk youth. Household assessments suggest that 30% of households in the catchment area had at least one child who attended the CFS or youth center.⁸⁹

The CFS was operated by trained teachers and supported by protection staff, volunteers from the community. These individuals were mostly mothers interested in the training and ensuring the wellbeing of children in the community. Together teachers and support staff organized daily activities to support children's education and psychosocial recovery, including games, songs, dances, informal education and other interactive activities. PCI trained safe space teachers and other protection staff to utilize stress-reducing or therapeutic techniques for children, such as through drawing and art, and to recognize symptoms of more severe trauma requiring specialized and/or professional attention. All staff at the CFS also received training from Haiti Partners, a local NGO that specializes in innovative approaches to early childhood development and learning. In line with the intention described in the Inter-agency Guidelines for Child Friendly Spaces in Emergencies,⁹⁰ the CFS created under Katye was a temporary support structure. Once schools re-opened, Katye scaled down CFS activities and began focusing on transitioning activities to local institutions.

To address the needs of older children, the youth center operated as a supervised space for youth to relax. Regular hip hop dance classes, Latin dance, theatre, chorus, and computer classes were held throughout the week. PCI identified and supported local individuals who taught these courses and in many cases served as mentors. During the summer, movie nights were hosted. The movies were used to facilitate discussions. For example, Hotel Rwanda

⁸⁸ Assessment conducted in July 2011 using stratified random sampling methodology.

⁸⁹ Data from household assessment conducted in February 2012 (N=365).

⁹⁰ UNICEF (2011) Guidelines for Child Friendly Spaces in Emergencies. Accessed April 2011. Available at <www.unicef.org/protection/Child_Friendly_Spaces_Guidelines_for_Field_Testing.pdf>.

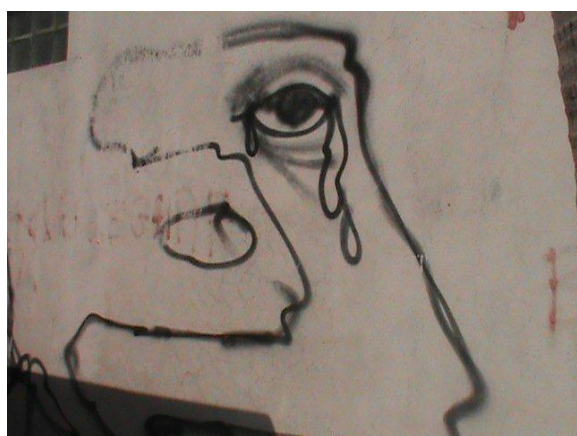
was shown and used to facilitate a discussion on political violence during which the youth drew parallels between Rwanda's and Haiti's history.

Sample Youth Center Activity Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9-11am		Chorus		Chorus	Theatre	Chorus
10-12 pm			Latin Dance			
2-5 pm		Hip-Hop	Hip – Hop		Latin Dance	Theatre

In addition to these regularly scheduled activities, frequent life skills courses were hosted by protection staff as their needs became evident. Health sector staff identified a rise in teen pregnancies at the clinic, and worked with protection staff to develop a series on sexual health education which included topics such as HIV education, gender based violence, and available referral services. In response to gang related activity in the area, a series of lessons on non-violent expression were planned. As part of this, youth took photographs of politically charged and gang related graffiti in Port-au-Prince and discussed the significance of each.

Life Skills Training for Youth: Discussions of Political Graffiti



Painted shortly after the January 2010 earthquake, the youth who shot this photo believes it depicts the countries collective grieving.



A photo of two men fighting over chicken, the youth who shot this photo believes it relates to rising costs of food and food availability in Port-au-Prince.

A group of 15 youths (5 from each zone) helped run the youth center, developing the rules of engagement for the youth center, leading discussions, and identifying new activities for the center. Through the center, these youths learned and modeled violence free, conflict resolution. One of the priorities identified by the youth was a need for vocational training. During the life of the project, 32 individuals (19% females) completed driving training and 26 individuals (100% female) completed beautician training.⁹¹ Other activities aimed at instilling a sense of civic responsibility were also planned. For example, assisted by Protection staff they planned an activity for 80 youths in the zone to meet with Haitian environmentalist Jenny Winnie for a course on recycling and the importance of protecting their environment. Youth learned about recycling in Haiti and discussed integrating recycling into their community waste management system. They learned about solar technology and its application for technologies they have seen (solar street lights installed in their community) and other innovations (solar ovens).

Building Capacity of Local Institutions

⁹¹ Courses selected based on interviews with 247 individuals to assess their interests, previous experience, and desired job. Individuals trained by local institutions.

To ensure the sustainability of the activities organized at the CFS and youth center, Katye aimed to strengthen local institutions so that activities could be transitioned to these centers at the end of the project. Within the first quarter of the project, PCI identified seven local organizations providing protection services (see the following table for a complete list); however, PCI discovered many community members did not know of them or how to access their services. Throughout the life of the project, when parents dropped off children at the CFS, during home visits, and when incidences were identified, protection staff provided community members information on these referral centers.

Protection Services Accessible to Program Participants at Baseline

Services Available	Institutions	
	Name	Location
Psychosocial and Health	Fame Perea	# 160 Ave. Poupelard
Nutrition and Family Reinsertion	Carritas St Antoine	#66 Ave. Poupelard
	Notre Dame des Victoires	# 128 Lalue
	Fondation Luce Pour Enfants Demunis	#287 Lalue
Legal Complaints	Police Nationale, Fort National	Ave Jean Brown
	Brigade Protection des Mineurs	Ave Mais Gate
Integrated Community Protection	Katye Protection Committee	Ravine Pintade

In addition to these existing referral centers, the two clinics supported by PCI, the CFS and youth center, and 5 neighborhood/zonal committees, served as entities where community members could seek help. In addition to building referral systems, PCI worked to strengthen the capacity of local institutions to respond to protection needs. The staff of the CFS developed a training for teachers in five local schools attended by children in the Katye area. Educators at these schools— Horace Etheart, Coeur Unirs, Ecole Mixte de Jehova, College de Compation de Jésus, and Ecole Nazaréen Libre— received individualized assistance on curriculum development using games and activities for making math and reading engaging and fun. This methodology has been proven to help children return to grade level. Over the course of the project, 20 teachers received this assistance, and all have replicated it for other teachers in their schools.

Training the Community on Child Protection

Katye aimed to transition protection from the tent (CFS center) to the community. Ensuring a universal understanding of children's rights was the first step to ensuring children were safe in the community. To that aim, 483 people (47% female) including 23 safe space teachers and protection staff and 460 committee members were trained on protection issues ranging from children's rights and gender-based violence to community-based management of children's activities. Household survey data suggests that at least one individual in half (47%) of the houses in the catchment area received training on child rights and protection.⁹² See Annex 5 for a full list of trainings.

The "Child Rights and Protection" training sessions were facilitated by a UNICEF certified trainer. Based in theory and rights-based ideology, the trainings were practical. Each focused on child development and protection and community based responses to protection violations against vulnerable groups. The first session aimed to strengthen community knowledge of protection issues such as education, health, entertainment, and physical and sexual abuse. The second session was participatory, encouraging community members to look at community based solutions to self-identified protection strategies. Together community members identified vulnerable groups—children, *restaveks*,⁹³ the elderly, and physically challenged—and committed to working together to address protection violations in their communities. Following these sessions, community leaders and Katye staff together picked out key

⁹² Data from household assessment conducted in February 2012 (N=365).

⁹³ A Creole term for Haitian children sent away to work as domestic servants.

rights identified in the Convention on the Rights of the Children to paint as murals in each of the five zones. Each right is illustrated by a local artist.

In addition to these formal sessions, PCI protection staff visited 214 households to discuss children's protection, children's health needs, education, and the prevention of violence and abuse. Each household received information booklets with illustrations and simple messages in Creole which were field-tested and approved by the Ministry of Health (MSPP) prior to distribution. As an illustration of the impact of these sessions, 93% of individuals receiving training on corporal punishment reported that the training changed their beliefs on appropriate mechanisms for punishing children.⁹⁴

Mainstreaming Protection in Reconstruction

In the context of a neighborhood program, protection means ensuring the community will be safe in all senses. Mainstreaming protection in urban planning efforts meant rehabilitation of latrines, hand-washing stations and other public infrastructure with protection measures in mind. Katye installed 20 solar lights illuminating public spaces and major walkways.

Location of Solar Lights



Narrow and steep passageways made of loose gravel were paved and widened or made into staircases with handrails. The majority of elderly (61%) individuals report the community is now easier to navigate than before the earthquake. Retaining walls were important risk reduction infrastructure preventing landslides and creating more livable space; they also created significant drop offs, potentially dangerous to children. To protect children, guard rails were erected at child height at every drop off. Having people living in a community under construction provides constant protection risks. From dropped nails to not-yet-covered drainage holes, construction sites can be hazardous. In marking hazards, the Katye team worked with the community to mitigate these risks.

Other Vulnerable Demographics

In addition to working with children, the Katye project aimed to ensure the wellbeing of elderly and handicapped individuals in the community. Meetings with the elderly and disabled prior to the inception of KAYTE found that many were suffering from depression and feelings of hopelessness; although many had the capacity and desire to help their families and communities, they lacked opportunities to do so. Assisting with safe-space and other community-based activities to enable their participation in child protection efforts helped address this problem. Both demographics worked with children: playing games, reading or assisting with homework. A third of all elderly in the community (31%) reported they were involved with the CFS.

⁹⁴ Data from household assessment conducted in February 2012 (N=365).

Feelings of hopelessness were also linked to people's inability to support their families and meet basic household needs. An estimated 69% of elderly and handicapped people surveyed were not engaged in wage earning activities after the earthquake (compared to 30% before the earthquake) and when asked about their situation, 66% indicated that it "was not good at all;" the majority of these respondents identified work opportunities as a way to improve their situation. To that aim Katye worked with interested handicapped individuals to help them start up small businesses. Individuals were given advice on financial management and opportunities to participate in CFW activities to raise the initial capital. Of all CFW participants who provided their birth date, over a fifth (22%)⁹⁵ were elderly.

Other needs also identified by handicapped and elderly were considered in the design and reconstruction efforts (see "Mainstreaming Protection"). Widened pathways facilitated movement. Enhanced lighting enabled improved safety. The installation of four benches and table sets also ensured that elderly individuals had a safe, shaded place to rest outside of their homes. Throughout the project, these individuals were also seen during routine home-based health care visits (see: "Targeted Home-based Care" for more information).

Sector: Health Systems and General Health

Objective: Integrate health strategies into neighborhood rebuilding, and support the Ministry of Health in the development of revised policies and plans for health system rehabilitation.

Indicator Table 6. Performance Indicators for Health

	Indicator	Target	Total Achieved	Percent Achieved
Indicator 1	Number of functioning primary health care centers, community health programs or mobile clinics supported or rehabilitated	1	2 Stationary Clinics	200%
Indicator 2	Number of health care providers trained (by type of training and type of health care provider)	28	6 Doctors	114%
			3 Nurses	
			23 Health Promoters	
Indicator 3	Number and percent of health facilities submitting weekly surveillance reports	1	2 / 100%	200%
Indicator 4	Number of community members receiving targeted health & hygiene education messages	6,335	21,159 ⁹⁶	334%

The earthquake significantly impacted the capacity of Haiti's health sector to address the needs of victims. All the pre-existing health clinics within the Katye catchment area were destroyed and/or heavily affected by the earthquake.

The objective of Katye health activities is twofold: (1) to integrate health strategies into neighborhood rebuilding to ensure universal access to health care in the community and improve health status during the life of the project, and (2) support the Ministry of Health in the development of revised policies and plans for health system rehabilitation. To support the second objective PCI piloted a methodology for transferring service provision from internationally-supported clinics to pre-existing health clinics and/or Haitian organizations working in the area to ensure sustainability. In working to achieve these outcomes, PCI's health activities reached an estimated 20,221

⁹⁵ Confidence range in figure is wide as only 60 of the over 4,900 individuals provided birthdates.

⁹⁶ As some individuals in the community have received targeted trainings on numerous health topics, this figure does not reflect an unduplicated set of beneficiaries.

beneficiaries in downtown Port au Prince during the project period. The table below provides a breakdown of beneficiaries by activity and gender.

Health Activities Summary⁹⁷

Activity	People Reached			
	Males	Females	Unknown	Total
Stationary health clinic services (total visits)	1,644	2,777	-	4,421 ⁹⁸
Stationary health clinic services (unique patients)	1,049	1,673	-	2,722
Mobile health clinic services	-	-	1201	1,201
Targeted Health Programs (Diabetes, MNCH, Deworming, etc)	-	-	144	144
Health professionals trained	13	19	-	32 ⁹⁹
Household visits & education	-	-	7,271	7,271
Health Distributions (kits, micro-nutrient, etc)	-	-	850	850
Cholera prevention & response activities	-	-	7,240	7,240

(1) Integrate health strategies into neighborhood rebuilding

Clinic Based Care

During the acute phase of the disaster, PCI established four stationary health clinics, one in the Katye catchment area.¹⁰⁰ To directly meet the health needs of families, this clinic was staffed by a team of Haitian doctors and nurses and supported by Katye-trained Community Health Workers (CHWs) during the project. Basic health exams, laboratory testing and counseling services were provided free of charge to members of the community. On average, the clinics served 300 patients each month. While many patients came from the Katye catchment area, people travel far distances for quality, free health care. Taking February as an example, 28% of patients lived within the five zones (indicated below in green), 41% lived in neighboring zones (Monplaisir, Christ Roi, Fort National demarcated below in yellow) and 29% came from distant zones within Port au Prince (Delmas, Bourdon, Cite Soleil demarcated below in red). Katye documented individuals travelling from as far as Kenscoff (over 25 miles) to visit the clinic given the reputation for quality free services.

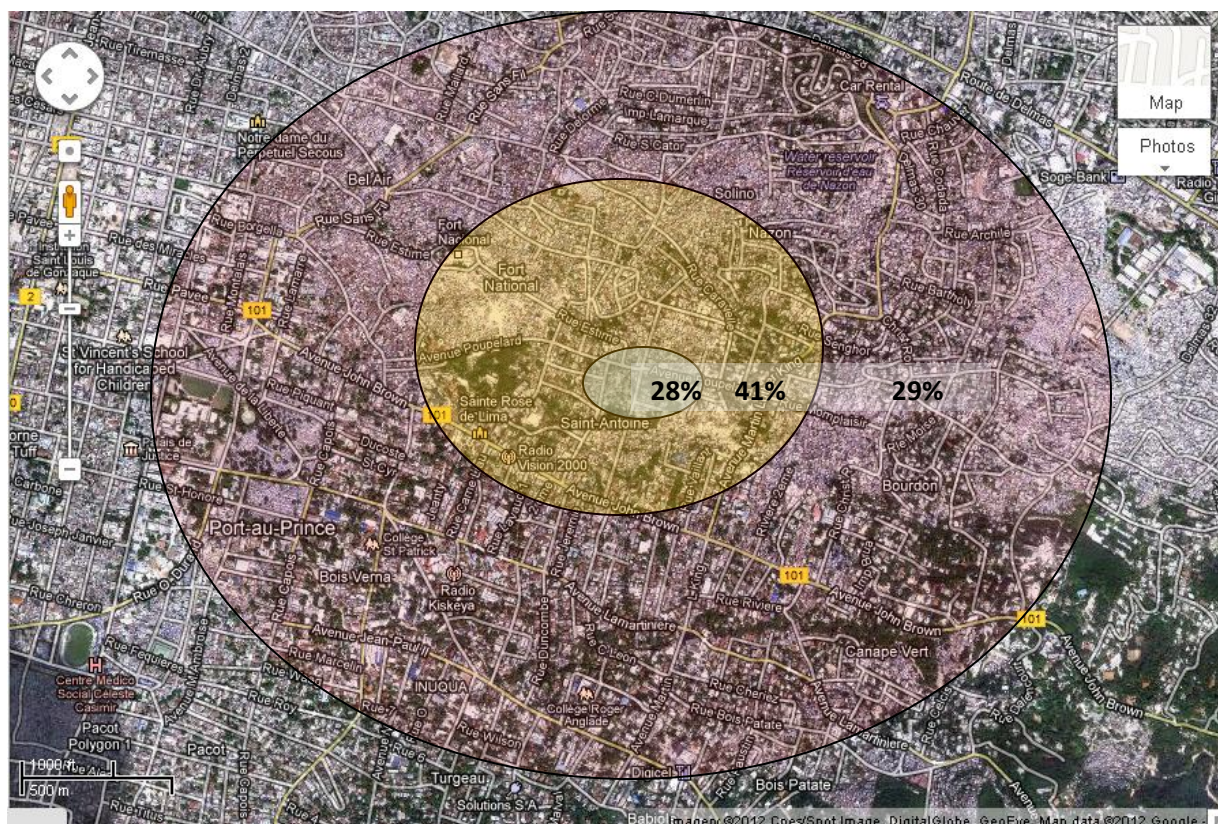
Geographic Distribution of Patients Attending Katye Free Clinic

⁹⁷ Includes duplication across activities.

⁹⁸ Numbers include both Katye clinic and Clinic Solidarite. As a result, totals differ slightly from numbers reported in table.

⁹⁹ 6 doctors, 3 nurses and 23 health promoters

¹⁰⁰ Clinics established under OFDA funded Haiti Earthquake Recovery Program (Agreement #: DFD-G-00-10-00093-00)



The most common illnesses patients had were acute respiratory infection (2% all patients; 5% children 0-15), fever (3% all patients; 19% children 0-15) gynecological infections (19%), and hypertension (9%).¹⁰¹ While still a problem, prevalence of each has declined significantly over the course of the project. Rates of diarrhea have nearly halved; the clinic saw an average of 11 cases per month in the fifth quarter down from 22 cases per month in the first quarter. Similarly with malaria, the clinic saw 5-7 cases per month in the first quarter but has not seen any cases this quarter.¹⁰² As the first and fifth quarters cover the same months and thus control for seasonal variation, health staff attributes this decline to improved access to health care and improved education. Relative to a year ago, patients are more likely to seek care when presented with fever or diarrhea and tend to seek care sooner, at first onset of symptoms.

The following table documents the monthly clinic attendance. Given these numbers, it is estimated that individuals from nearly all households in the community have visited the clinic at least once.

Table 14: Monthly Visits to Katye Free Clinic¹⁰³

	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Cum
New	214	129	189	189	230	148	213	290	192	220	179	132	153	20	2498
(% Female)	62%	63%	57%	65%	57%	60%	63%	57%	69%	65%	66%	64%	63%	75%	

¹⁰¹ Denominators of percentages include only individuals at risk of illness. For example denominator of gynecological infections only includes women of reproductive age.

¹⁰² As 88% of households report seeking care at the free clinic in response to symptoms such as prolonged fever, PCI takes this clinic level data to be a strong proxy for incidence of malaria in the community more broadly. Data from PCI Willingness to Pay Assessment.

¹⁰³ Table includes individuals seen only at the KATYE free clinic in Ravine Pintade. This clinic was closed in December 2011. The health indicators includes patients seen at Clinic Solidarite during February while PCI was supporting their operations.

Return	96	301	76	61	102	91	85	197	121	52	238	109	156	14	1699
(% Female)	70%	61%	68%	66%	60%	58%	56%	69%	70%	83%	67%	61%	71%	57%	
Total	310	430	265	250	332	239	298	487	313	272	417	241	309	34	4197

Medications and supplies (worth \$18,003.48) donated by Americares and USAID were used to support Clinic Solidarite. The clinic submits regular surveillance reports to the health cluster and directly to the MoH in accordance with MoH regulations.

Targeted Home-based Care

Meeting the health needs of this population demanded community-based outreach and care. As illustrated in table 13, facility-based care is only one component of the broader approach to provision of primary care to ensure universal access to essential services. The health team regularly visited vulnerable and high risk individuals in the community including elderly, disabled, pregnant and otherwise immobile community members. During the life of the project, the health team visited the homes of over 100 individuals, including 61 elderly and 6 handicapped individuals.

The blood pressure of individuals with diabetes was routinely monitored and patients were consulted on appropriate diets and exercise. If severe, medication was also prescribed. Handicapped individuals were monitored on a regular basis. The health team changed their bandages and transported them to tertiary care facilities as needed. Pregnant women who came to the clinic or who were identified by CHWs were provided routine tests such as anemia and were provided with multi-vitamins while supplies were available. Women were referred to the general hospital (HUEH) in case of anticipated complications. Most pregnant women visited the clinic monthly during their second and third trimester.

Community Health Workers

To support the provision of community-based health care, Katie trained a cadre of local individuals as community health workers. These individuals, selected by community leaders, either had experience or interest in improving the health of the community. 19 individuals (5 men and 14 women) graduated from the training course. The group included a woman who was pursuing a degree in midwifery at the time of the earthquake, but, given damage to the school and the impact of the earthquake on her financial situation, she was unable to continue the program. To teach and develop their skills, PCI developed seven modules on key topics related to health. The seven¹⁰⁴ modules were designed by program staff with support from experts (including Mentor Initiative). As outlined in Table 15, topics covered a wide range of disease types and knowledge necessary for both prevention and treatment of common health problems in the communities.

Health Worker Trainings¹⁰⁵

Month	Training	Participants		
		Male	Female	Details
February	Introduction to Community Health	3	2	3 MDs, 2 RNs
April	Infectious Diseases (Malaria)	7	16	23 CHWs
April	Infectious Diseases (Malaria)	2	7	6 MDs, 3 RN
June	Cholera Treatment / Prevention	6	15	21 CHWs
July	Maternal and Child Health (Nutrition)	6	13	19 CHWs
July	Maternal and Child Health (Nutrition)	1	4	1 MD, 3 RNs

¹⁰⁴ The 11 topics outlined in the proposal were all covered. Longer sessions rather than more frequent sessions proved more viable given CHW schedules and logistics. As appropriate, topics were consolidated.

¹⁰⁵ Includes duplication across activities.

August	Routine Childhood Primary Care (Deworming)	9	13	22 CHWs
November	Home based Prevention (Hygiene)	6	18	21 CHWs, 3 RNs
January	Sexually Transmitted Disease (HIV/AIDS)	9	11	16 CHW, 2 MD, 2 RN
February	Chronic Disease (Diabetes)	6	16	19 CHW, 1 MD, 2 RN

Following each training session community health workers organized community meetings to share the information they learned. These meetings were supervised by health staff (physicians and nurses). Additionally, CHWs discussed health issues with community members as they waited to be seen at the clinic. CHWs were provided additional training and mentorship based on the level of understanding and comfort which each CHW worked with the community. The CHWs were instrumental in surveillance. Given their health knowledge as well as their knowledge and relationship with the local community, they were often the first to detect cases of disease including cholera. They also helped identify pregnant women including pregnant teenagers who were less likely to visit the clinic. A total of 57 pregnant women were seen at the clinic during the life of the project. Nearly twice as many were provided care through home visits. Early detection allowed for improved treatment. All of the CHWs reported that they plan on continue working as health agents following the end of the project.

Community Prevention Activities

Cholera Prevention: Two large scale cholera prevention campaigns were organized during the life of the project: one in December 2010 following the initial outbreak and one in July 2011 in response to a rise in incidence as a consequence of the rainy season. These campaigns included training, awareness-raising on hygiene practices (e.g. hand-washing and household water purification) and community-based management of suspected cholera cases. These campaigns as well as ongoing surveillance and education activities reached 7,240 individuals. In March 2012 before the rainy season began, refresher trainings were provided and ORS was distributed to all households in the five zones.

Childhood Disease Prevention: In August, a Vitamin A and deworming campaign reached 69%¹⁰⁶ (280 children: 122 females and 158 males) of children age 1-9 years who received de-worming medication and 58%¹⁰⁷ (33 children: 18 males, 15 females) of children age 0 - 12 months who received vitamins. Additionally, all 701 children attending the Child Friendly Space (CFS) during September and October received a basic “back to school” check-up and lessons on proper nutrition and sanitation. Children with severe or acute malnutrition were referred to the general hospital for care.

Chronic Disease Prevention: Chronic diseases such as diabetes pose a serious threat to vulnerable individuals such as elderly populations in populations with poor health care access such as Ravine Pintade.¹⁰⁸ To enable improved care, health teams measured blood pressure and other vital statistics during home visits aimed at early detection of chronic diseases. Fifteen individuals were diagnosed with diabetes during the life of the project. All were provided care and counseling.

MSPP Priority Disease Prevention: To reduce HIV transmission, activities were aimed at educating patients at the clinic, community youth and CHWs on HIV transmission. Prevention and treatment was organized around World Aids Day by the health team in coordination with community leaders. Through education campaigns and condom distributions, over 8,000 individuals were reached. To address malaria transmission, PCI provided training to 23 community health workers on malaria transmission, prevention and treatment. These individuals have since replicated the training for 270 community members.

¹⁰⁶ Percentage based on demographic data which enumerated 404 children aged 1-9 in the catchment area.

¹⁰⁷ Percentage based on demographic data which enumerated 57 children aged 0-12 months in the catchment area.

¹⁰⁸ Pan-American Health Organization. Health Situation Analysis and Trends Summary. Accessed at <http://www.paho.org/english/sha/prflhai.htm>. February 2012.

Additionally, PCI organized prevention activities for targeted groups. To improve maternal and child wellbeing, PCI has prioritized targeted prevention activities for pregnant and nursing women. This includes provision of pre and post-natal care including referral services, nutrition counseling, distribution of pre-natal vitamins and birth planning services which were provided to pregnant and nursing women.

Cholera Prevention Activities

The Katye project began a month after the first case of cholera was reported in the Artibonite department. Before cholera got to Port-au-Prince, PCI initiated prevention activities to mitigate the spread of cholera. Eighteen staff members, 42 CFW team leaders and 21 CHWs received comprehensive cholera training. These individuals led cholera information campaigns to help raise awareness about household water purification techniques, regular hand-washing practices, and methods to safely treat and cook foods, among other key health and hygiene issues. 479 individual household hand-washing facilities were constructed and stocked with soap, buckets, bleach.

Nurses registered and referred 11 possible cholera cases, all from outside the five zones.¹⁰⁹ According to standard MoH protocol, every responding organization was required to collect epidemiological data to track and monitor cases and submit it to the national laboratory for official testing. Nine of the 11 cases referred by PCI were confirmed positive for cholera (all survived).¹¹⁰ Together this data indicates that between December 2010 and February 2011, 11 cases of cholera were detected in the five zones, suggesting a cumulative incidence of around 1.9 per 1000. This rate is significantly less than 31.5, the cumulative incidence in Port au Prince at the time.¹¹¹ While the cumulative incidence climbed to 54.0 in Port-au-Prince by December 2011, the attack rate in the Ravine Pintade neighborhood never exceeded 2.4.¹¹² These figures suggest that through education and prevention activities PCI prevented over 280 cases of cholera and more than 2 cholera-related deaths (assuming the Port-au-Prince case fatality of 0.9%).¹¹³

To prevent cholera cases as the rainy season began, a refresher training on cholera prevention and treatment was held in March 2012 for 25 individuals (12 females; 13 males). Following the training, the team of 25 distributed water buckets filled with Aquatabs, ORS, soap, information on cholera prevention (MSPP approved), and contact information for the 10 closest, functional CTCs. As they distributed these kits, they replicated the training for each household. Through this exercise, the team reached all 574 households.

(2) Health System Rehabilitation

To help ensure access to health care in the acute phase of the response, international entities set up hundreds of informal facilities providing free care. Over half of the post-earthquake clinics operating in the Nazon area were closed between November 2010 and November 2011. Of those remaining, many are struggling financially to stay open. Identifying the need for a more sustainable approach to health system rehabilitation, the Katye-piloted activities transferred service provision to local entities. During the life of the project, Katye worked to transfer responsibility for operating the clinic to the community with adherence to MoH standards and policies as they pertain to private community health services. The health staff trained a clinic-based Urban Health Committee to supervise and support clinic operations including the administration of funds. Committee members (14 total, 57% female, 14%

¹⁰⁹ Four were identified by community mobilizers and 7 presented at the clinic (3 men and 4 women, including 1 minors under 18 years old and 1 person over the age of 60 years) to local cholera treatment centers managed by Haiti State University Hospital, Médecins Sans Frontières (Delmas 33), and GHESKIO.

¹¹⁰ A follow up assessment conducted in March 2012 aimed at validating the quality of community based surveillance found 9 additional individuals who had cholera in the past year. Of them, only 2 were living in the community at the time of infection. Others had moved to the neighborhood after released from the CTC because of better access to food and shelter necessary for a full recovery. All 9 individuals had received cared from a CTC. None had contaminated another family member or neighbor.

¹¹¹ http://reliefweb.int/sites/reliefweb.int/files/resources/CB7BD7D9160F1FAF8525784F005691FF-Full_report.pdf

¹¹² <http://www.who.int/hac/crises/hti/HealthCluster-Bulletin30-21122011-ENG.pdf>. Calculation assumes population of 5525 with 13 total cases of cholera identified.

¹¹³ http://reliefweb.int/sites/reliefweb.int/files/resources/CB7BD7D9160F1FAF8525784F005691FF-Full_report.pdf


elderly) were identified for their experience with clinic management, knowledge of accounting, finance and management as well as trust and respect in the community and received training in the management of clinic operations. Ten meetings and trainings were held covering topics ranging from finance, health monitoring, and sustainability. In conjunction with the committee, PCI has worked to develop a cost recovery strategy agreed upon by the community which included a mix of revenues sources including service fees, fundraising, donations and other forms of private and public support.

These activities were supported with rigorous research to evaluate the: (1) demand for health services, (2) ability and willingness to pay for primary care services, (3) supply of primary care services (both free and otherwise) in the area, (4) costs of maintaining a community clinic, and (5) regulations of concern to a community run clinic.¹¹⁴ Ultimately the research suggested that charging an affordable rate to community members the clinic would run a monthly deficit of \$2500-\$4500 depending on whether medication was supplied for free. In order to cover costs the clinic would need to charge 650-730 HTG (\$16-\$18 USD) a price far above the rate charged at neighborhood clinics. Charging a much lower rate (100 HTG; \$2.50 USD), only 60% of individuals who would attend a free clinic would seek services.

As the community-supported model has proved not be feasible, PCI linked to an existing local NGO partner and the MSPP to ensure the community has access to a sustainably-managed clinic. To that aim, PCI supported Clinic Solidarite, a locally managed and MSPP-supported facility. The clinic provides free consultations and medication to an average 22 individuals a month. PCI is currently supporting both their health and administrative staff to improve the quality and capacity of the clinic. Linking with an existing local NGO partner and working with them to improve the quality of their services helps ensure the community has access to a well provisioned, high-quality, sustainable clinic. Extensive mobilization and community education encouraging patients who attended the Ravine Pintade clinic to now visit Clinic Solidarite aimed to prevent a disruption of care. Remaining medications and supplies (originally donated by Americares and USAID) were used to support Clinic Solidarite.

¹¹⁴ The full report, methodologies and results are available in Annex 7: Willingness to Pay Assessment.

Clearing Land to Provide Accessible Neighborhoods (CLEAN) Program



Since the January 2010 earthquake, rubble has remained one of the major obstacles to recovery and reconstruction efforts in Port-au-Prince. The MTPTC estimates that upwards of 80,000 buildings were severely damaged or destroyed and an estimated 10 million cubic meters of debris was created, but that only 2 million cubic meters were removed in 2010-- of which 265,000 m³, about 13% was removed by CHF under the CLEARS 1 program between March and September 2010. One year later, hundreds of Haitian families were still living in informal and make-shift camps around Port-au-Prince, unable to return home and rebuild. CHF submitted a proposal for rubble removal in November 2010, which OFDA funded in Feb 2011. CHF's OFDA-funded CLEAN program directly addressed these problems by providing free demolition and rubble removal services to home owners, clearing lots to enable the reconstruction of shelters by NGO shelter partners.

The overarching goal of the CLEAN program was to enable the reconstruction of shelters, infrastructure, and essential services in earthquake affected neighborhoods through the demolition of red houses and rubble removal. CHF worked with local partners, the municipal government and NGOs to clear rubble to facilitate shelter construction and infrastructure rehabilitation through demolition and information sharing.

The project achievements documented in this report include:

- **Demolished and cleared 586 houses** that were heavily damaged during the earthquake. Cleared spaces enabled the construction of transitional shelters by partner organizations.
- **Cleared 244,829m³** of rubble, 93% of the target.
- **Recycled 73,500m³ of rubble—nearly a third (30%) of rubble removed** in the project— facilitating the use of the materials for other disaster risk reduction activities.
- **Designed and implemented a manual demolition program—Cash for Production—based on amount of rubble cleared—rather than a daily stipend (Cash for Work)**
- **Trained and hired 3,536 laborers** from the target communities for rubble removal activities—nearly double the initial target. Roughly a third (30%) of laborers were women.
- **Developed and shared maps with geospatial information for each red house demolished**; information was shared with shelter partners in an open source (kmz) format.

As a significant outcome of the project, the cleared rubble provided homeowners' and shelter partners' access to safe, cleared land for shelter reconstruction. Partnerships with other organizations involved in shelter recovery extended the benefits of the CLEAN project far beyond the end of the project.

Tools and Methods

To adequately document the large scale rubble removal efforts undertaken during the CLEAN project, CHF developed a tracking system which aggregated data, produced reports on the total volume and source of rubble, and ensured all rubble was transported and dumped at the official dump site. The system has since been adopted by UNDP and used to monitor rubble removal throughout Haiti. To track red home demolition, CHF worked closely with MTPTC to establish protocols for the verification of red houses and validation of demolition permits, to ensure that CHF was not held liable for the demolition of homes and property. Field engineers worked closely with CHF engineers to assess and monitor demolition activities. CHF developed a comprehensive database and maps (kmz format) with the GPS coordinates, names of home owners, addresses, volume of rubble, and dates of completion for all red houses demolished which was shared with MTPTC. The tool is described in more detail in the "Rubble Removal" section. In addition to the primary programmatic data collected used to monitor and evaluate progress,

targeted studies were undertaken throughout the life of the project to provide evidence for programmatic decisions. A key example is the comparison of cash for work and cash for production outputs. CHF evaluated the incentive methods to determine the most efficient system and ultimately used the information to lead a shift from CFW to CFP.

Beneficiaries

The primary beneficiaries of the CLEAN project were the land owners of destroyed homes who benefitted from demolition and rubble removal services enabling access to a transitional shelter. These activities also created thousands of jobs. Over the life of the project 3,536 residents of earthquake-affected neighborhoods benefitted from livelihood support, a benefit to them and their families. As documented in the following table, through these activities CLEAN reached over 20,000 earthquake-affected people, 141% of the target.

	Original Target	Revised Target	Total Achieved	Percent Achieved
Red House Beneficiaries	15,000 (3,000 HH)	5,485 (1,097 HH)	2,930 (586 HH)	52%
CFP/W Beneficiaries	9,000 (1,800 HH)	9,000 (1,800 HH)	17,680 (3,536 HH)	196%
Total	24,000 (4,800 HH)	14,485 (2,897 HH)	20,610 (4,122 HH)	142%

While not included in these figures, many additional households benefitted from the CLEAN project. Many of the plots were previously inhabited by multiple families (owners and renters) who all benefitted from the demolition activities. Similarly, many of the homes adjacent to the red houses were at risk. While their properties were not cleared they benefitted from work on their neighbors' homes as well as work clearing roads and access ways. Arguably, all residents of the target communities benefitted. Work in other CHF projects demonstrated that cleared streets enabled the return of municipal services such as waste removal and water trucking, services that would benefit the community beyond just owners of red houses. Similarly, the economic stimulation of CFP has ripple effects in the local economy beyond the direct beneficiaries.

By sharing information CLEAN provided a direct benefit to the local government and other shelter partners.

Program Description by Sector

Sector: Shelter and Settlements (S&S)

Objective: Link demolition services and information systems to efficiently create space for transitional shelter construction.

Sub-Sector: Emergency/Transitional Shelter

Indicator Table 1. Market Infrastructure Rehabilitation

	Indicator	Target	Total Achieved	Percent Achieved
Indicator 1	Number of households receiving Emergency/Transitional shelters, pursuant to SPHERE standards and FOG guidelines*			
Indicator 2	Percent of total affected population receiving Emergency/Transitional shelter assistance*			

Indicator 3	Total USD amount and percent of approved budget spent in the affected local economy*				
Indicator 4	Number of cubic meters of rubble removed		262,000m ³	244,828m ³	93%
Indicator 5	Number of (red) houses demolished and cleared for transitional shelter construction		1,097	586	53%
Indicator 6	Number of neighborhood maps and databases shared with stakeholders		--	1 ¹¹⁵	--
Indicator 7	Number of person/days of cash-for-work activities	Workers	1,800	3,536	105%
		Person/days	45,120	33,731	75%
Indicator 8	Percent of rubble recycled for use on-site ¹¹⁶		--	73,500m ³ ¹¹⁷	--
Indicator 9	Land area cleared for shelter assistance*				
Indicator 10	Number of parcels cleared for shelter assistance ¹¹⁸		1,097 ¹¹⁹	586	53%
Indicator 11	Number of households returning to green houses in project area facilitated by rubble removal efforts*				
Indicator 12	Number of yellow houses made accessible for repairs by rubble removal efforts*				

* These indicators were not applicable to the project as implemented.

1. Pre-demolition Planning

In addition to existing mapping data provided by UNOPS and MTPTC, CHF employed assessors to blanket areas of planned demolition and identify destroyed properties. Each identified property was assessed for mechanical demolition feasibility.

During the mapping process, mobilizers began working with community members, introducing the project and collecting authorization documents from homeowners. Community consultation and mobilization played an important role in all stages of the CLEAN project from beneficiary registration to pre-demolition planning. Once activities started in a neighborhood, CHF staff hosted weekly meetings. The first meeting aimed to explain the program objectives to community residents and solicit their participation and support. Subsequent meetings were used to update the community on activities, obtain buy in, and discuss any challenges. Community support of the project helped identify red house owners and encourage them to participate in CLEAN.

Successful identification of houses for demolition and registration depended on strong community mobilization. Before a house could be demolished, a series of approvals and waivers had to be signed. CHF used the MTPTC habitability assessment as the basis of red home identification, but all houses were subsequently verified by CHF

¹¹⁵ Comprehensive site maps (as described in the proposal) were not developed given timeline, resources and information needs. Rather, CHF developed a Google Earth (kmz format) map with the GPS location, commune, head of household information (name, phone, and NIF ID), address, method of demolition (heavy equipment or manual), date completed, and total volume of rubble for each red house. While contained in one Google Earth map, the information covers all project areas/neighborhoods of the CLEAN project. The database was shared with 3 active shelter partners—GOAL, Cordaid, and CRS—and the MTPTC.

¹¹⁶ No target was set for this indicator.

¹¹⁷ All delivered to the CHF CRUSH recycling site

¹¹⁸¹¹⁸ For the simplicity of documentation, the CLEAN project has assumed one shelter is equivalent to one parcel of land as this was the case in the majority of properties. In a few exceptions, more than one shelter existed on a larger land parcel but without better tenure information tracking these exceptions proved too complicated.

engineers. A list of selected houses, completed permits and beneficiary waivers were submitted to MTPTC which signed off on the permits. Over the course of the project, CHF received approval for demolition from 726 beneficiary red house owners. No house was demolished without written approval from both the homeowner and MTPTC.

Getting personal waivers signed required significant partnership with the community. Identifying and verifying homeowners was a difficult process given unclear land tenure. Additionally, many land owners were absent, having left or died in the earthquake. Other land owners were not interested in having the space cleared. To assist with this process of identifying land owners, innovative approaches were taken. The CLEAN program was the focus for two of CHF's ANN KOLE ZEPOL radio programs on www.signalfmhaiti.com (90.5 FM) which worked to inform the public of the free demolition services provided by CLEAN. Several red house owners were found through the call-in connection. Even with strong community mobilization and innovative approaches, property authorizations took an average of 5-7 days.

2. Demolition

Demolition began once all approvals were signed. Beneficiaries of demolition activities fell into two categories: (1) identified shelter beneficiary to be constructed by a CLEAN shelter partner and (2) non-shelter beneficiary household. In some areas, registration of homeowners for demolition started with beneficiary lists from shelter partners (such as GOAL, CRS and Cordaid). In other areas, including parts of Delmas and in Tabarre commune, shelter partners did not have beneficiary lists that could be used to identify houses for demolition. In these areas, CHF used local municipality lists of red homes as the starting point for identifying houses for demolition. Non-shelter beneficiary household were selected if they met all of the following criteria:

- Legal or otherwise verified¹²⁰ claim to a 'red house' property
- Household was willing to participate in rubble removal
- Household accepted that neither CHF nor the implementing agency is providing shelter
- Household cooperated with CHF team in developing the rubble removal strategy
- Household could safely vacate the premises during the rubble removal activities
- Clearing of the 'red house' property removal was critical for the implementation of other rubble removal activities
- CHF could obtain necessary permissions

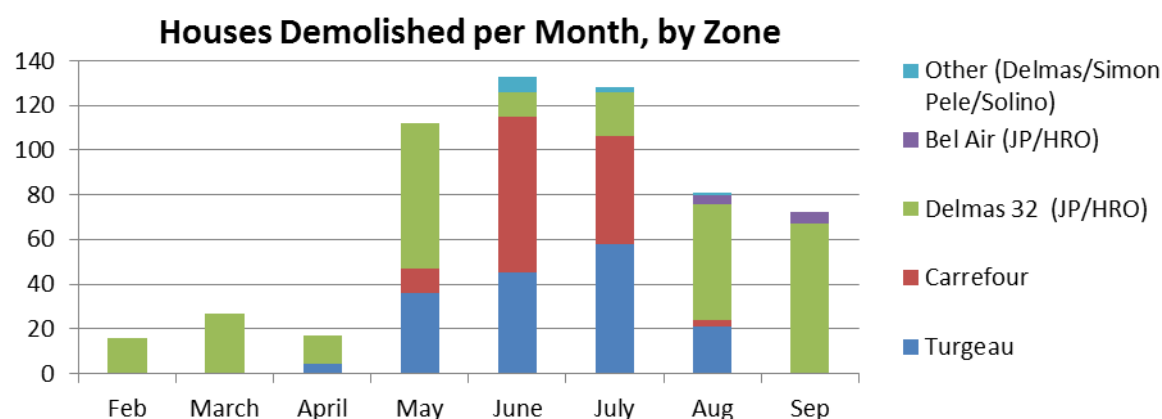
As they were already working in the Delmas 32 area and started the project with a beneficiary list, J/P HRO was able to begin demolition within the first month of CLEAN. Given the time-consuming challenges of locating red house owners and getting demolition authorizations, CHF demolition activities did not start until April. CHF began demolition and loose rubble removal with heavy equipment on April 25, 2011 in Turgeau. Construction began a month later in Carrefour. All demolition was finished by September.

Every week, field teams identified houses to be demolished, about 3 houses per team. Before demolition began, the supervising engineers consulted on methods of how best to demolish the house in order that it is brought down in the correct manner. In some cases, demolition required neighbors to evacuate their homes. Often CHF had to temporarily relocate squatters to ensure their safety. The plans were shared with the MTPTC, who worked in partnership with CHF to gather GPS coordinates, beneficiary contact information, before and after photos, and rubble figures. In addition, CHF developed a Google Earth (kmz format) map which visually documented each house demolished under the CLEAN project. Houses were plotted and labeled with their GPS location, commune, head of household information (name, phone, and NIF ID), address, method of demolition (heavy equipment or manual), date completed, and total volume of rubble. While contained in one Google Earth map, the information covers all project

¹²⁰ Consensus verification was accepted as adequate verification. By this process, four witnesses and a panel of community leaders agree that the beneficiary owns the land. If there is no objection, this is taken as proof of land rights.

areas/neighborhoods of the CLEAN project. The database was shared with 3 active shelter partners—GOAL, Cordaid, and CRS—as well as the MTPTC and mayor.¹²¹

Ultimately 586 houses were demolished under the CLEAN project. The following graph provides a break down by month and zone:



The 586 houses represent 53% of the target. CHF's ability to meet demolition targets was affected by increased costs of demolition and rubble removal, including a sharp increase in fuel costs (discussed further under "Rubble Removal"). Additionally, in early August CHF reviewed and revised its work plan. Planned demolition activities in Delmas and Tabarre were cancelled due to difficulties in identifying beneficiaries and getting necessary permissions within the project timeline (discussed further under "Program Description by Geographic Area"). These costs and logistic challenges prevented CHF from achieving 100% of its target.

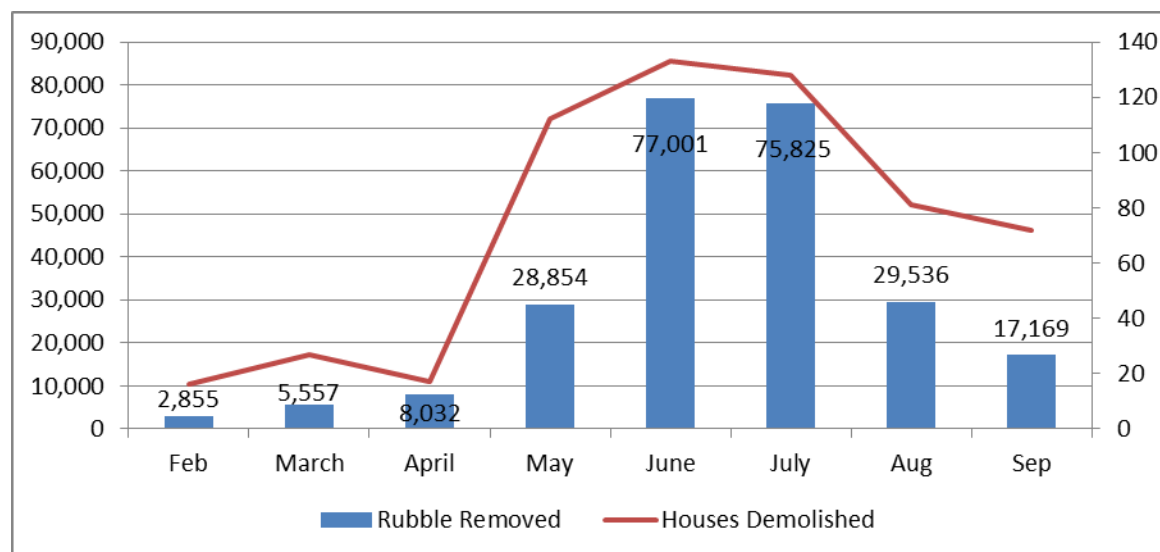
3. Rubble Removal

Ultimately, 244,829m³ of rubble was cleared under CLEAN, 93% of the target and enough rubble to fill nearly 7,000 school buses. Of the total, 75% (182,795m³) was cleared by CHF and 25% (62,034) was cleared by J/P HRO. Of the rubble removed by CHF, 67% was created through demolition and clearing activities and 33% was loose rubble removal. In addition to the red houses benefitting from demolition and clearing activities, an estimated 2,930 households—81% of the target—were served through rubble removal and clearance of red homes. A much greater number of neighborhood residents benefitted from the cleared streets as well. As documented in the table below, rubble removal targets were met or exceeded in nearly all of the project zones.

Location	Revised Location	Volume of Rubble	Revised Target Volume of Rubble	Achieved	Percent Achieved
Jean-Baptiste Turgeau	Greater Turgeau	12,000m ³	80,000 m ³	86,160 m ³	108%
Tabarre	Tabarre	75,000m ³	20,000 m ³	--	
Village Solidaritaire	Other (Delmas, Solino)	40,000m ³	21,000 m ³	4,491 m ³	21%
Delmas 32 (J/P HRO)	Delmas 32 (J/P HRO)	65,000m ³	56,320 m ³	55,455 m ³	98%
Pipeline (Carrefour, etc)	Carrefour	70,000m ³	80,000 m ³	92,143 m ³	115%
--	Bel Air (JP/HRO)		4,680 m ³	6,579 m ³	141%
Total		262,000m ³	262,000 m ³	244,829 m ³	93%

¹²¹ This form of mapping was determined to be more appropriate given timeline, resources and information needs than the comprehensive site maps originally planned.

The amount of rubble removed per month spiked once verification and approvals had been obtained. June was the most productive month, with a total of more than 75,000 m³ removed, as shown in the table below.



The majority (nearly 83%) of the rubble cleared under the CLEAN project was cleared using heavy equipment. The use of machinery enabled CHF to clear large quantities of rubble efficiently. Yet not all rubble was accessible by the equipment. While machinery was used to clear more than 90% of the rubble in Turgeau and Carrefour, nearly all rubble in Delmas and Solino were cleared using CFP. The project design allows staff the flexibility to use CFP or machinery as needed based on the terrain of each zone. The following sections discuss the two methods of rubble removal—mechanical and manual—and some key challenges.

Rubble Removal by Heavy Machinery: Where feasible, CHF teams used heavy machinery to clear debris. Once the demolition of a house was finished, hauling trucks were used to load the rubble. A loader and a skid steer loader cleared away the remaining debris. The full process of demolishing and clearing a house took on average 2-3 days. Once the space has been cleared by CHF, either by heavy machinery or by manual laborers, CHF informed the relevant shelter partner so that they could begin reconstruction.

To ensure that the dump trucks deposited the rubble at the approved facility, CHF developed a ticketing system for tracking and validating both manual and mechanical removal. For each truckload of rubble a tracking system compiled information on work location, municipality, license plate number of truck, name of the trucking company, name of the driver, capacity of the truck, time that the truck left the loading site and time it arrived at the dump site. The information was entered into a centralized tracking system which aggregated data and produced reports on the total volume and source of rubble. The system built in extensive checks to ensure transparency and enabled detailed tracking by area, type of structure, and method of removal. CHF's system has since been adopted by UNDP.

Manual Rubble Removal: In areas that were difficult to access with heavy machinery, rubble was cleared manually using a system that provided employment and infused cash into the local economy. A total of 67 houses were demolished manually. Areas cleared by manual labor include those located down narrow path-ways barely wide enough for a wheelbarrow, perched precariously on the edge of the mountainside, or tightly clustered among neighbors' homes. Under CLEAN, CHF successfully pioneered the switch from Cash for Work to Cash for Production as a primary form of incentivizing manual demolition in communities. Evidence collected during the project suggested that CFP, a system of paying daily wages, proved less efficient than CFP where laborers were paid based on outputs (m³ of rubble cleared). CHF found that CFP teams cleared an average of 17.75m³ per day compared to the average 3.34m³ cleared by CFW teams. This suggests that CFP teams are nearly five times as productive. J/P HRO

confirmed this finding by reporting increased productivity per month as well after switching to Cash for Production. Cash for Production has since become the standard model for manual demolition and debris removal.

Under the CFP system, teams of 11 workers and 1 team leader were paid based on outputs. Workers were selected by the community from the affected neighborhood. Women head of households were prioritized. The CFP contracts stipulated that a minimum of three women had to be included on each 12-person team. CHF and the team discussed the terms of the contract which was signed and valid for 24 days. After 24 days, a new team of workers was selected. By employing people in the neighborhood, CHF was also able to reinsert some much needed cash into severely affected communities. Workers were provided equipment such as safety boots, heavy-duty gloves, hard hats and hand tools. The work hours were 7am – 2pm, Monday through Saturday. Payment was 350 gourdes (approximately \$8.75) per cubic meter of rubble cleared (approximately 2 wheelbarrows). Depending on the distance from the project site to the rubble collection site, payment per cubic meter could be negotiated with community leaders to keep the work-to-payment ratio fair. The payment is calculated per team and split equally among them. Payroll was managed by Fonkoze, a local microfinance institution.

Many of the Cash for Production workers trained and hired (3,536 laborers total) were hired from the target communities for rubble removal activities—2,395 by J/P HRO and 1,141 by CHF. These figures exceeded the target of 1,800. A J/P HRO's hiring practice early on in the project (use of CFW and other shorter term contracts) resulted in the hiring of more people.¹²² Of the 3,535 CFW/P laborers, 30% were female. The total number of person days of work reached (33,731) was 75% of the original target. CFP teams were more productive and were able to achieve more in less time than CFW teams. Through the CFW/P labor, CHF injected \$192,101 in the form of wages into the community.

Challenges and Rising Costs: Despite challenges, 93% of the rubble targets were met. Setting rubble targets and planning rubble removal proved more complicated than initially anticipated. Not only was there significant variation in the size of houses, the amount of rubble generated by houses of similar size varied substantially. The average amount of rubble per house ranged from 205m³ in Delmas 32 to 731m³ in Bel Air despite a similar composition of home sizes. Most houses greatly exceeded the initial estimate of 120m³ used in the project design. Similarly estimations of costs and timelines were continuously amended. The price of rubble ranged considerably based on highly variable factors including costs of gas, slope of terrain, density of area, and materials used in home construction. These factors also affected time. As such, the size of a house could not be used to accurately predict how long it would take to demolish and remove rubble or how much the work would cost.

Additionally as a result of rising gas, labor and rental costs, the price of rubble removal increased over time. Increased costs of operations impacted achievements. For example, rising costs of fuel impacted the cost of transporting rubble. Between October 2010 and August 2011 gas prices increased 38% from 119.1 HTG to 164.7 HTG/gallon. Another factor affecting costs is the time and distance to Truitier, the only official dump site for Port-au-Prince. The location of the dump site, near Cite Soleil was far from the project sites and only accessible on roads that were often congested. The distance translated into increased time spent in transport and associated costs. Also due to security concerns in Cite Soleil few contractors risked transporting in the evening and night. In Carrefour some rubble was transported to CHF's USAID-funded CRUSH recycling site in Bizoton, Carrefour rather than Truitier. Efficiency was increased 430% using the CRUSH site relative to the Truitier dump site.

As a result of these challenges, setting appropriate targets proved challenging. Houses were bigger, more expensive and more time consuming to clear than expected. Despite CHF and J/P HROs experience, the changing environment complicated both planning and implementation activities. Ultimately demolition and rubble removal activities cleared

¹²² J/P HRO started CLEAN using a CFW system but transitions to a contract system due to low performance under CFW. The contract system established a fixed payment based on outputs paid upon completion of the demolition. The contract system worked in theory, incentivizing teams to perform. In practice, the system resulted in corruption. J/P HRO switched to CFP in July and in August achieved their highest level of productivity.

586 red houses, 53% of the target figure. CHF estimates that the cleared plots will enable at least 586 shelters to be erected. The following table provides a breakdown of cleared houses by zone.

Location	Revised Location	Number of Houses to be Cleared	Revised Number of Houses to be Cleared	Achieved	Percent Achieved
Jean-Baptiste Turgeau	Greater Turgeau	100	250	164	66%
Tabarre	Tabarre	500	100	--	--
Village Solidaritaire	Other (Delmas, Solino)	220	200	10	5%
Delmas 32 (J/P HRO)	Delmas 32 (J/P HRO)	576	311	271	87%
Pipeline (Carrefour, etc)	Carrefour	N/A	200	132	66%
--	Bel Air (JP/HRO)		36	9	25%
Total		1,396	1,097	586	53%

4. Recycling Debris

Nearly a third of the rubble cleared during the CLEAN project was recycled and used for disaster risk reduction activities. 73,500m³ of rubble was brought to CHF's USAID-funding CRUSH recycling site in Bizoton, Carrefour. The crushed rubble was subsequently used for non -structural uses – backfill for patching roads and input in slabs for transitional shelters, retaining walls and storm channels, and sand bag fill. In addition to the environmental benefits of recycling, bringing debris to Carrefour was much faster and cheaper than to the Truitier dump site in Cite Soleil.

In addition to the rubble brought to Bizoton, CHF collaborated with IFRC and the Haitian Red Cross on one small pilot recycling initiative in Turgeau. CHF helped demolish the damaged Haitian Red Cross Headquarters building. The rubble, 550m³, was left on site to be hand crushed by Red Cross workers and recycled into paving materials. (See Annex 8 for more details).

5. Information Dissemination and Coordination

A primary aim of the project is to link potential shelter construction efforts with areas newly cleared by CHF rubble removal teams and to provide relevant data for each site collected during the development of the DRRS. CHF and J/P HRO participated in shelter cluster meetings in Delmas, Port-au-Prince, Tabarre and Carrefour, and the Debris Working Group. At the meetings, CHF explained the CLEAN demolition and clearing services and exchanged information.

Coordination with shelter partners proved more challenging than anticipated. Many partners were working in camps where most beneficiaries proved not to be home owners. In other cases the timeline of project did not line up—partners had either already begun construction or were not ready to begin until after the CLEAN project ended. It took many organizations much longer than expected to identify their areas of recovery. Other partners were working in smaller areas (less than 5 houses) where the scale did not enable a cost effective use of heavy equipment or had selected areas that were already cleared. Despite these challenges, CHF attended all cluster meetings and coordination events and ultimately found some suitable partners. Strong partnerships were established with Goal, Cordaid, ACTED, J/P HRO, and CRS. Information was shared with all of these partners as well as MTPTC. CHF worked in coordination with each of the partners to ensure efficiency and avoid duplication of work.

In addition, in August CHF held an internal workshop to review strengths, weaknesses and lessons learned with all program staff, including engineers, community mobilizers, controllers and supervisors. Some of the lessons learned helped prompt further discussion. For example, each of the following suggestions prompted a shift in current practice:

- In the absence of strong tenure, multi-media communication strategies (including radio messaging) are helpful at locating and verifying home ownership.

- Greater standardization is necessary with regard to habitability assessments. Houses marked as “red” had a wide range of damage, from lightly impacted to severely destroyed, more than 60% damaged. Communication with home owners regarding the meaning of the markings also needs to be improved.
- The local government involvement can and should be greater. Assistance from the Mayors’ offices in closing roads or control traffic would increase productivity and reduce accidents.
- Cash for Production increased productivity of manual demolition and rubble removal activities indicating that payment based on output should be used.
- Recycling of rubble has benefits to the environment as well as efficiency of demolition activities as recycled materials can be used on site and do not require transportation, an expensive endeavor.

6. Shelter Recovery

As designed, objective 1 of the project was to, “link demolition services and information systems to efficiently create space for transitional shelter construction.” The project was premised on the idea that cleared plots would enable shelter partners to construct transitional shelters. Over the life of the project CHF worked with shelter partners to coordinate plot clearing with transitional shelter construction. Yet in practice, many partner organizations were behind schedule and thus not available and ready in all locations. Additionally, not all shelter partners reported their construction activities back to CHF. As a result, providing an accurate count of the number of shelters constructed on plots cleared by the CLEAN project is not possible. The best information CHF has is that GOAL built 101 shelters for CLEAN demolition beneficiaries. Cordaid plans to build some 200 shelters, though construction had not been started at the end of the project. UNOPS constructed approximately 300 shelters in Delmas 32, but the percentage that benefitted CLEAN beneficiaries is unclear.¹²³

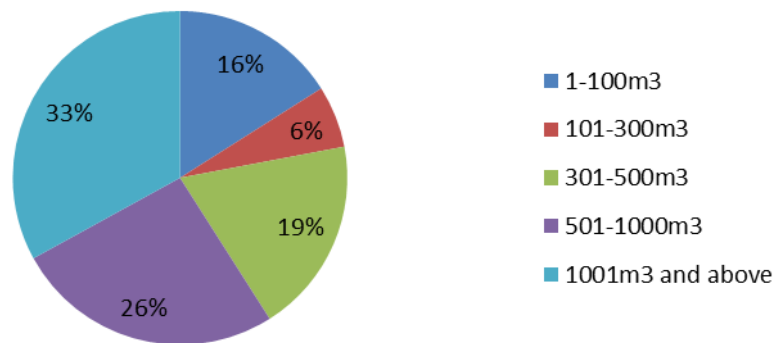
Program Description by Geographic Area

The CLEAN project proposed to clear rubble from four areas in Port-au-Prince that experienced heavy damage after the earthquake: Tabarre, Village Solidaritaire, Delmas 32, and Jean-Baptiste Turgeau. The selected areas were all on neighborhoods with large numbers of damaged and destroyed houses. Areas where transitional shelter construction has already begun but where the lack of space significantly slowed the process were prioritized. The target sites were slightly amended during the project to conform to the government priority areas for return of IDPs which was released after the CLEAN contract was signed. CLEAN activities ultimately benefitted seven of the 16 government priority areas including: Jean Baptiste, Bois Patate, Bas Canape-Vert, and Villa Rosa in the Turgeau area of Port-au-Prince commune; and Delmas 31, 33 and Mais Gate in Delmas. Demolition activities were planned in an 8th priority area, Carrefour Clercine in Tabarre, but ultimately not undertaken. Ultimately the project took place in partnership with five shelter partners in four communes in Port-au-Prince. The following section documents activities by geographic area.

Turgeau

To enable shelter recovery work planned by both GOAL and Cordaid, CHF cleared sites in four neighborhoods in Turgeau: Jean Baptiste, Bois Patate, Canape-Vert, and Villa Rosa. Both organizations provided lists of potential beneficiaries who registered as red house owners. A strong partnership with GOAL enabled CHF mobilizers to quickly contact home owners, get authorization forms completed, and verify ownership documents. As a result of the partnership, CHF demolition activities started first in Turgeau, at the end of April. The need for rubble removal was greater than all shelter partners initially estimated. The house sizes were larger and more variable than initial estimates suggested. Houses averaged 645m³, significantly more than the estimated average size of 120m³. The following pie chart illustrates the average amount of rubble removed per demolished house in Turgeau.

¹²³ The percent of these 300 shelters built on plots cleared by CLEAN is unclear. An initial cross-verification of the UNOPS and J/P HRO lists suggested only 8 of the shelters were beneficiaries of CLEAN demolition activities but project staff suspect that this is a reflection of difficulties cross-verifying information across the databases rather than an accurate number.



For the larger houses, especially the 2 or 3 story houses that would be dangerous to demolish manually, CHF used heavy equipment. The area was generally less populated and flatter than the other zones enabling the use of machinery.

CHF also collaborated with Cordaid to demolish homes in Villa Rosa. Partners worked together to register beneficiaries. Access to many of the neighborhoods in the area, including Cite Merikain, were congested requiring the use of manual demolition teams. Work clearing 800m³ of rubble enabled Cordaid to begin the activities outlined in their neighborhood re-development plan. CORDAID plans to build some 200 shelters. Demolition of houses was not completed by the end of the CLEAN program. It is hoped that the demolition operations can be completed under UNDP's Debris II program.

In addition to the houses, CHF collaborated with IFRC and the Haitian Red Cross in Turgeau on one small pilot recycling initiative, whereby the damaged Haitian Red Cross Headquarters building was demolished. 550m³ of rubble was left on site to be hand crushed by Red Cross workers and recycled into paving materials.

Ultimately 164 houses were demolished and 86,160m³ of rubble was cleared from the greater Turgeau area. The demolition enabled GOAL to build 101 shelters for CLEAN demolition beneficiaries by the end of the project and facilitate activities that will enable Cordaid to build additional structures. GOAL noted that many of the families living in the Cite Je Crois camp along the community began to return once demolition activities were completed and shelter construction began.

Carrefour

CHF worked with partners to clear 92,143m³ of rubble in Carrefour, 115% of the planned rubble. CHF was able to clear more rubble from the Carrefour site than any of the other target locations. This can be attributed to three factors: (1) the amount of rubble needing to be cleared, (2) recycling of rubble, and (3) use of heavy equipment.

- **Need:** The houses in the zone were relatively large; their demolition created significant quantities of rubble. An average sized house demolished in Carrefour was 503m³ but the range was huge - under 100m³ to more than 1000m³.
- **Recycling:** Speed and efficiency were gained from transporting rubble to the USAID-funded CRUSH recycling site in Bizoton, Carrefour as opposed to the Truitier dump site. Because of the costs in both time and distance of transporting to Truitier, CHF found that contractors able to transport to Bizoton were four times more efficient than those having to transport to Truitier. Because of traffic congestion, contractors are forced to increase the number of trucks making the round trips to the dump site.
- **Heavy Machinery:** Nearly 90% of rubble cleared in Carrefour was done using heavy machinery. The houses were larger, mostly 2 or 3 story, and therefore more dangerous to demolish manually. Additionally, access to the zone was better, enabling the use of the machinery.

Over the course of the project 132 houses were demolished in Carrefour. CHF shared all information with Cordaid who planned to construct shelters on the cleared land.

Delmas 32

CHF worked with sub grantee JP/HRO in Delmas 32. J/P HRO was already working in the area prior to the project and was able to start demolition activities within the first month of the project. The area was large and complicated with a mix of structures ranging from three-story concrete buildings to single-story buildings of wood and corrugated zinc. Within the identified area, 1,105 houses were identified by the MTPTC as red. Of those, 271 of the 311 houses targeted for demolition were removed. J/P HRO was able to clear 55,455m³ of rubble, 98% of the amended target.

Linking demolition services to ongoing shelter construction activities proved difficult for J/P HRO in Delmas 32. Within the CLEAN area, UNOPS planned construction for some 300 shelters. J/P HRO demolished 271 houses in Delmas 32, to enable this construction but cross-verification with UNOPS list found only 8 matches. This could be partly explained by inconsistent beneficiary registration systems, the name of the recipient shelter beneficiary could be different than that of the home owner authorizing demolition or names and street addresses could be documented differently.

While the majority of the work undertaken by sub grantee J/P HRO took place in Delmas 32, the organization also demolished 9 houses and cleared 6,579m³ of rubble in Bel Air.

Other: Delmas / Solino

Initial intentions to work in Village Solidaritaire were adapted based on need, government priorities and other shelter partners. In addition to the Delmas 32 area, the CLEAN project cleared rubble from three of the government priority areas in Delmas—Mais Gate, Delmas 31, Delmas 33. Catholic Relief Services (CRS) has planned transitional construction projects in these areas and in Solino and provided CHF with an initial list of shelter beneficiaries. In these areas, 10 houses were demolished and a total of 4,491m³ of rubble were cleared.

Progress in these areas was slowed by poor communication from shelter partners. Partners identified in 2010 did not provide details on their project areas until after CLEAN had ended. As a result, in early August CHF amended the work plan and did not implement demolition activities with heavy equipment in these areas. CHF did ultimately use this information to assist in demolition in rubble removal but these activities (such as rubble removal in Delmas 9 in partnership with the French Red Cross) took place after September 2011. As of May 2012, the British Red Cross is still working on authorization of demolition in their project area, Delmas 19.

Tabarre

CHF worked with the Mayor's office in Tabarre and ACTED to prioritize red home owners still in 72 remaining camps. The potential for recovery was great in this area—many of the lots were three times the size of the footprints of the houses which would have enabled multiple shelters on each plot—yet it proved difficult to link demolition services to camps. Many camp dwellers were not in fact home owners. In Tabarre, most of ACTED's shelter and resettlement beneficiaries were not home owners or in some cases, even renters. This made it impossible to obtain the necessary authorizations to demolish houses. In early August, CHF revised its work plan to exclude the Tabarre area. No work took place in Tabarre by the end of September 2011 when the program wrapped up.

Supplemental Materials

Annex 1: Final Evaluation of the Katye Project

Annex 2: CLEARs Indicator Table (CLEARs 1, Katye, CLEAN)

Annex 3: CLEARs 1 Success Story

Annex 4: Beneficiaries of the Katye Project

Annex 5: Trainings by date and sector of the Katye Project

Annex 6: Rain Water Harvesting Model

Annex 7: Willingness to Pay Assessment of Health Services

Annex 8: IFRC and Haitian Red Cross Rubble Recycling in CLEAN Project