Final Program Performance Report

Name of Project: Lower Coco River Risk Reduction Project
Grant Award No.: AID-OFDA-G-11-00221
Location: Municipality of Waspam, North Atlantic Autonomous Region
Country/Region: Nicaragua
Approved Period: September 20th 2011 - May 18th 2013
Reporting Period: September 20th 2011 - May 18th 2013
Date of Report: August 16th, 2013

The community of Sawa on the Banks of the Coco River

Contact Details

CRS Headquarters:

Contac Person: Jason Sullivan
Mailing Address: 22 W. Lexington St. Baltimore, MD 21201
Telephone: 410.951.7489
Email: jason.sullivan@crs.org

CRS Nicaragua

Contact Person: Hugh Aprile
Mailing Address: 2da. Avenida Suroeste, frente al Ministerio de la Familia, Managua.
Telephone: (505) 89760077
Email: hugh.aprile@crs.org

I. SUMMARY OF OVERALL PERFORMANCE OF THE PROJECT

In September 2011, OFDA/USAID awarded Catholic Relief Services (CRS), in partnership with the Apostolic Vicariate of Bluefields (VAB), funding for an eighteen month disaster risk reduction project targeting sixteen indigenous Misquito communities of the Lower Coco River District in the Municipality of Waspam, Nicaragua. Among the poorest and most isolated populations in Latin America, the Lower Coco River communities are subject to recurrent and increasingly severe hydro-meteorological hazards, specifically frequent hurricanes and flooding. Responding to the serious risk issues of this region, CRS proposed a two-tiered disaster risk reduction effort to mitigate the effects of recurrent disasters in the short-term while taking steps to sustainably reduce risk and break the chronic disaster – recovery cycle for the long-term. The strategy included capacity building at the community and institutional levels to improve emergency warning and communications systems and to update and increase the efficiency of evacuation routes and processes that will save lives and resources in the short-term. In addition, the project contemplated an in-depth participatory Vulnerability Analysis and Mapping (VAM) study to take the critical first step toward long-term sustainable disaster risk reduction by comprehensively analyzing the economic, social and environmental conditions of the area with respect to risk mitigation, including evaluation of possible preventative relocation of the most vulnerable communities.

In order to reduce risks and increase capacity of the communities of the Lower Coco River to prepare for and respond to frequently recurring hydro-meteorological disasters, the project implemented several key activities:

- Direct training of 429 community members in risk reduction concepts and practices;
- Organization and training of 288 community leaders into functioning CODEPREDs (Local Disaster Mitigation and Response Committees) and BRILORs (Emergency Rescue Brigades) in 16 communities;
- Organization, training and equipment donation and repair for a fully functioning Early Warning System in the 16 target communities and at the municipal center in Waspam;
- New or revised community-based emergency response plans and risk maps in 16 communities and a revised municipal response plan;
- Participation of over 1,800 community members in disaster response simulations;
- Construction of a strategically placed dedicated evacuation shelter with additional designs and plans for expansion;
- Strengthened connections and coordination between the 16 target communities and the emergency agencies that serve them;
- Increased capacity – through training, organization and equipment – of local emergency service organizations to respond to identified needs;
- A comprehensive Vulnerability Analysis Mapping study of the socio-cultural, political, and economic environment and risk conditions of the target communities and the identification of and development of draft plans for alternative mitigation strategies for the communities, including a full plan and budget for relocation.

The Lower Coco River communities fully participated in the initiative along with the COMUPRED (Municipal Disaster Mitigation and Response Committee) and Civil Defense staff that serve them locally. All participants now have increased knowledge of key concepts and have practiced key strategies for risk reduction, emergency preparedness and emergency response. Through the VAM study, local perspectives were consulted and captured, with the results left in the hands of the communities as well as with regional and municipal authorities to guide ongoing efforts to reduce the risk conditions and improve the quality of life for these highly vulnerable populations. In the process, the program participants became much more aware of their risk conditions and their role in finding solutions to their vulnerability as demonstrated by the high willingness of 8 of the 16 communities to relocate. Many participants came to realize that they must change in order to provide a better future for their children, as summarized by Angelina Jackson Henar from Sawa who said, "Parents should be conscious that their children are in danger, that their women won't put up with these conditions and that they should look for a safer place, thinking about the development of their children."

A typical housing settlement in Living Creek

In sum, the project successfully increased the capacity of the local communities to reduce risk and prepare for and respond to emergencies while at the same time laying important groundwork for further efforts to find a more permanent and sustainable solution to the chronic risk conditions in which these communities live.

II. FINAL RESULTS

Global Indicators:

Indicator	Goal	Achieved
Cost per Beneficiary	**$71.25**	**$59.53**
% of total affected population served	**100%**	**100%**

Sector Name: Humanitarian Studies, Analysis, or Application.

Objective: *The communities of the Lower Coco River have a long-term plan for sustainably reducing risks from chronic hydro-meteorological disasters.*

Sub-sector Name: Applied Studies, Analysis or Application

Number of Beneficiaries Targeted and Reached in Sub-Sector:

Community	# Beneficiaries Targeted	# Beneficiaries Reached
Kiwastara	860	860
Raya Pura	265	265
Auya Pura	194	194
Andris	1,430	1,430
Klampa	721	721
Boom	480	480
Sawa	887	887
Uhran	335	335
Sih	244	244
Living Creck	564	564
Utla Mahta	432	432
Tura Laya	62	0
Rancho Escondido	98	98
Plankira	185	185
Wangki Awala	98	98
Cabo Gracias a Dios	1,370	1,370
Koom	0	867
Total	**8,225**	**9,030**

Indicator	Goal	Achieved
Number of institutional members and community leaders involved in emergency management that know and agree with their roles in a long-term plan for sustainably reducing risks from chronic hydro-meteorological disasters.	**12 COMUPRED + 48 COLUPRED**	**288**

A total of 288 community leaders (18 COLUPRED members per community) and 4 COMUPRED officials participated in the emergency management trainings and simulations. The program benefited enormously from the enthusiastic participation of these leaders in the consultation process carried out as part of the VAM study in addition to local capacity building trainings. These leaders provided important inputs into how the project was organized and run, the elaboration of risk plans and maps, and the debates and conclusions of the VAM study. Throughout the project, there was effective and positive coordination with the municipal government and COMUPRED, who have demonstrated their commitment to improving their capacity to serve their constituency, especially the communities of the Lower Coco River, where limited resources have impeded their outreach capacity.

Community assembly in Kiwastara

The initial consultative process found that it had been seven years since the majority of the Local Emergency Committees (COLUPREDs) were established, and that the committees as well as the emergency rescue brigades (BRILORs) were non-functional. By law in Nicaragua, a COLOPRED should consist of approximately 10 commission leaders (for example early warning, evacuation, transport and shelter leaders) and 8 members of the BRILOR. Through the project's outreach and training activities, these committees were fully reinstated in the target communities and trained in risk management concepts and practices and the responsibilities and procedures of their committees. These leaders then supported the project by leading and coordinating disaster mitigation and response outreach and planning in the target communities. In Wangki Awala and Rancho Escondido, it was determined that the communities were too small to form full COLOPREDs and instead only BRILORs were formed. The "able" population (healthy between 18 and 60 years old) of participants in these two communities is only 27 and 23 people respectively. As a result, the BRILORs were trained to handle the full range of emergency responsibilities for their small communities.

Indicator	Goal	Achieved
Vulnerability Analysis and Mapping (VAM) study, plan, and case study complete and published.	**1**	**1**

The VAM study was central to the project and aimed to completely understand the risks and vulnerabilities faced by the target population, as well as to propose viable and community-acceptable alternatives to mitigate those risks. IDEAS, a Nicaraguan consulting firm won the contract and completed the study over a period of 5 months.

The study team initially visited all 16 target communities. After the first round of visits and interviews, however, at the study team's suggestion, CRS dropped the communities of Tuhra Laya and Rancho Escondido from the study since they are legally in Honduran territory and any mitigation or relocation plans would need to be handled through Honduran authorities. In addition, Oxfam had recently completed a similar study in three of the communities and offered to contribute their information to the report.

The study was highly participatory and the communities fully engaged in the risk analysis and later in the economic, social and environmental analysis of possible relocation zones. **Of the 14 communities, 8 showed a high willingness to relocate, 2 said they would do it under certain conditions, and 4 affirmed that they are not interested in moving.** The communities that agreed with relocation ultimately designated acceptable zones and minimal conditions required for their relocation.

The final study report includes analysis, conclusions and recommendations; a proposed settlement design; and a budget for the resettlement of the 11 communities that expressed the disposition to move in order to improve their living conditions. The total budget, which includes roads, social infrastructure, and housing for 1,450 families, summed to over US$11.2 million. However, it is important to note that funding for recommended ongoing assistance over a five-year period for agricultural adaptation is not included in that figure. Understanding that resources to finance any relocations are limited, the report also prioritizes the communities in three phases based on their vulnerability and willingness. These documents have been delivered to municipal authorities and the regional government for their analysis and potential implementation.

Typical house in the community of Klampa

Aside from the financial challenges, the study confirmed that socio-political, economic and cultural aspects of these communities also complicate finding a permanent solution to the disaster risk vulnerability of these populations. While the communities perceive that they are at high risk, they also hold the government and others responsible for helping them confront that risk by proving services of evacuation, food, and other resources during times of crisis. At the same time, the communities showed a deep distrust of the government and other outside organizations. They know of or have experienced inadequate attempts at relocation and they do not believe that the authorities will act in their interest. They fear losing forest, land and river access resources that they currently control close to the river. Their culture and livelihoods are very tied to the river and for those closer to the coast, the ocean, and relocation to greater safety implies moving away from that connection and from their current livelihoods, as meager as they may be. Understandably, the greatest resistance comes from older community members while youth with more education and more awareness of the opportunities of an improved quality of life are more willing.

Despite the challenges remaining for the implementation of a solution to the risk challenges of the communities of the Lower Coco River, the VAM study and the community discussions represent an important step forward in the search for those solutions. Social awareness of the issues was greatly increased, and the fact that 8 communities showed a high willingness to relocate is promising. In addition, through the VAM consultations, an important potential alternative solution was suggested by the participants that may provide a more viable path for a transition of these communities out of the risk zone. The communities have suggested a hybrid between relocation and remaining, where some economic and social activities would be moved to nearby, yet safer locations while the residences are maintained on the riverside. The

inhabitants could move to the higher zones during flooding times and return during the dry season. They could gradually learn to produce some of their agricultural crops in the alternative zone while still fishing and relying on the river for transport. Social services, such as schools and health clinics, could gradually be built up in the alternative zones, providing a magnet for an incremental transition of livelihood focus from the riverside to safer areas.

VAM assembly in the community of Boom

It is clear that while the VAM study provides important analysis and concrete steps for relocation as a possible solution, the complexity of the situation requires continued analysis and perhaps unorthodox solutions that have not yet been considered. Christian Medical Help (AMC), a local NGO that has many years working in the Rio Coco watershed, noted that following Hurricane Mitch several Rio Coco communities were relocated to better conditions with land, housing, and schools. They reported that in time, 80% of the people had returned to riverside locations. Any relocation efforts will have to be taken with great precaution and on a small scale to start. As suggested by the VAM study consultants, a Phase 1, which includes the most vulnerable and willing communities (Kiwastara, Raya Pura, and Auya Pura), should be prioritized.

Indicator	Goal	Achieved
Number of stakeholders that are aware of and understand the underlying factors, and have identified and agreed upon realis tic solutions to the chronic vulnerability of the populations of the Low er Coco River.	**480**	**429**

A total of 429 stakeholders directly participated in project training activities and have shared the information within their own communities through participation in community assemblies, forums and meetings. While overall direct training participation was slightly lower than the project goal of 30 people per community, the high quality participation of the core group of 288 leaders and the enthusiasm of the training participants for spreading the word will contribute to widespread preparedness in the communities.

Additional activities, such as community simulations (please see Indicator 5 below) and radio messaging, have given an opportunity for the majority of the population to participate and learn how to prepare for adverse situations. The level of maturity and understanding that communities gained in relation to their risk levels was evident in the VAM study, as the population became more receptive to discussing their risk and vulnerability and readily contributed their time to discuss these issues during the consultations. As such, there is now a substantial population of

community leaders that are connected with public emergency communications and response infrastructure and are aware of procedures and practices for response.

Sector Name: Natural and Technological Risks.

Objective: *The communities of the Lower Coco River have improved capacity to manage early warning systems and rapid emergency response.*

Sub-sector Name: Hydro-Meteorological Hazards

Number of Beneficiary Targeted and Reached in Sub-Sector:

Community	# Beneficiaries Targeted	# Beneficiaries Reached
Kiwastara	860	860
Raya Pura	265	265
Auya Pura	194	194
Andris	1,430	1,430
Klampa	721	721
Boom	480	480
Sawa	887	887
Uhran	335	335
Sih	244	244
Living Creck	564	564
Utla Mahta	432	432
Tura Laya	62	0
Rancho Escondido	98	98
Plankira	185	185
Wangki Awala	98	98
Cabo Gracias a Dios	1,370	1,370
Koom	0	867
Total	**8,225**	**9,030**

Indicator	Goal	Achieved
Number of people who will benefit from proposed hydro-meteorological activities.	**8,225**	**9,030**

The proposal census for the project included 16 communities with a population of 8,225 inhabitants. After the initial community visits, a couple of participation changes were made which increased the population served. When it was determined that the communities of Tura Laya and Rancho Escondido were legally in Honduran territory, they were dropped from the VAM study. While both would also have been dropped from the rest of the project (due to differing legal structures for disaster preparedness), the European NGOs GOAL (Irish) and the Civil Volunteer Group (GVC-Italy) were able to include Rancho Escondido and Cabo Gracias a Dios as part of a DIPECHO VIII grant that they won covering the Upper Coco River and some

communities in Honduras. Project staff from all three organizations coordinated activities and methodologies throughout the project, ensuring that all of the Rio Coco riverside communities are integrated in the Community Early Alert System for the watershed, now coordinated through SINAPRED and Civil Defense. In addition, CRS included the community of Koom (Kum) in the project. While not subject to the same flood conditions and risk as the other communities, Koom is the refuge site for the lower watershed communities and as such was included a part of the early alert network and prepared to receive evacuees from the other river communities. With these changes, the total project population rose to 9,030 individuals in 1,804 families in 16 communities.

Indicator	Goal	Achieved
Number of hydro-meteorological policies/procedures modified as a result of the activities to increase preparedness for hydro-meteorological events.	**17 (One per community plus 1 COMUPRED**	**17**

A total of 16 communities now have up-to-date and functioning community structures (COLOPREDs plus BRILORs) that are integrated into the Rio Coco Watershed Early Alert System and are part of the SINAPRED/Civil Defense lists of disaster-prepared communities. They also have up-to-date community risk maps and emergency plans, including evaluation procedures and routes. The following activities contributed to this achievement:

- Seven communities received community alert systems and 2 additional systems were repaired;
- Six communities received radio equipment, and 2 radio systems were prepared;
- Nine community risk maps were elaborated and 7 were updated;
- Twelve community risk plans were elaborated and 4 were updated;
- 288 community leaders and 429 community members were directly trained.

The development process of the maps and plans has been highly participatory so that community members identified their own strengths and weaknesses and at the same time proposed their own solutions to their problems. The information generated in these debates and workshops are the inputs of each plan and map. Citizen participation, especially in the process for developing risk maps, is important to increase awareness of the critical points and to facilitate identification of both the evacuation routes and the location of temporary shelters.

Community risk plans have been developed and finalized in all 16 targeted communities by CRS, GVC and GOAL, completing 100% of the project goal for this indicator. Copies of these documents were shared with COMUPRED and the Civil Defense, both of whom offered their endorsements of the plans, and COMUPRED has updated their municipal plan incorporating the inputs of learning from the project trainings as well as the community plans. In addition, final laminated plans were returned to each community and will be available for reference during ongoing outreach and training visits from COMUPRED staff.

Indicator	Goal	Achieved
Number and percent of people trained in hydro-meteorological-related activities retaining knowledge two months after training.	**480 people trained**	**429 trained**

Risk Management knoweldge retention test in the communitiy of SAWA

Project training and post-tests were carried out in three phases. The post-test methodology was designed with a 10 question test. Each question had a total value of 10 points for a total possible score of 100. The test evaluators scored each response between 0 and 10. The total score reflects a percentage of retention.

The first post-test was carried our following the workshops on "Responding to Disasters", which included family level disaster response, local emergency committees, and local emergency plans. A total of 429 people participated in the trainings. Radio programs addressing topics related to risk management began transmitting during this period. A total of 6 people per community were administered the test in 14 communities for a total of 84 people (31 women and 53 men). The average score was 60% retention. Staff determined that it was difficult for the community members to understand more theoretical concepts about vulnerability and disasters. The radio programs were designed to reinforce these concepts. In addition, the next trainings would by nature be more applied, which was expected to help understanding and to reinforce concepts from the first cycle.

The second cycle covered Early Alert Systems and their Components. Sub-topics included monitoring and vigilance of danger, communications networks, alert and alarm mechanisms and evacuation plans, and 409 community members participated in the trainings. The post-test was administered to 124 people (43 women and 81 men), an average of 9 people in each community. As expected the test scores increased to 90% retention, showing a strong comprehension of the topics covered. The results indicate that this topic proved more practical than that of the first test, which covered more theoretical risk analysis, allowing for the key concepts to be more easily understood and applied by the population.

EWS workshop in the community of Utla Mahta

A third test originally planned by the project was adjusted to serve as an application of learned materials, or rather, a "learn by doing" workshop. CRS contracted outside professionals to impart the emergency planning and mapping activities, and the overall training population was reduced and stratified to make sure that in addition to community leaders, a good selection of elderly, youth and women were included. As this was not a traditional training, no post-test was conducted.

Indicator	Goal	Achieved
Number of community maps and psycho-social inventories of resources at risk and the available resources for mitigation efforts for 16 communities.	**16**	**16**

In the first months of Project implementation, staff carried out an emergency resource inventory in each of the target communities. This included human resources and capacity, highlighting health workers, teachers, and local authorities, as well as materials and equipment (radios, boats, motors, etc). They also counted and located social infrastructure such as schools, churches, and bridges. All of these resources were incorporated into the local risk maps and emergency plans.

In total, 16 community risk maps and emergency plans were finalized, 14 developed for the first time and two updated. As regards the maps, 11 were developed from scratch and 5 were updates. As mentioned above, CRS worked directly with 14 communities and GOAL and GVC covered the remaining two.

CRS contracted experienced consultants to facilitate the mapping exercises with project staff, COMUPRED staff, community leaders and a selection of other community members emphasizing the participation of elderly and youth. In this way the community's ancestral knowledge was included in the exercises while at the same time the openness of youth to new tools and technologies was accessed to the benefit of the project. In consultation with the mapping consultants and our local partners, project staff decided to slightly alter the *Mapeo a Mano* methodology to accommodate the resource conditions of the project zone more effectively. Considering the extreme poverty of the participants, staff concluded that rather than trying to use enlarged digital maps as contemplated in the proposal, the mapping consultants would work with each community to draw their own simple maps on cardboard using crayon that will be later photographed for COMUPRED records and sealed in plastic for community reference. The Google maps available for the zone are quite distorted and printed ink tends to run and fade in the humidity. The use of easily obtained local materials will help ensure that the leaders are able to update the documents over time.

COLUPRED leaders in the community of Sih show their local emergency plan and their community risk map

As a result, the maps were worked with the communities completely by hand and with local materials. The facilitators carried out two working sessions in each community where they mapped points of interest, including evacuation routes, river ports, and helicopter ports.

Smaller groups were used for this exercise with a total participation of approximately 179 people (CRS directly implemented the exercises in 14 communities and 157 people (119 men and 38 women). With smaller groups, the facilitators were able to give more directed and personal attention to the participants with a learning-by-

doing methodology.

All of the maps and plans included full participation and validation from local COMUPRED and Civil Defense officials. Printed copies are filed with COMUPRED and both COMUPRED and VAB have electronic copies as well. In addition, each community retains a printed copy for their use and reference.

Indicator	Goal	Achieved
EWS functions as planned during drill exercises at the end of the project.	**2**	**2**

Part of the technical training provided to the local emergency committees included practice runs of alert communications and evacuation. Each community ran an emergency simulation that allowed the committees and advisor staff to identify weaknesses and errors and correct them directly with the local emergency actors (COLOPREDs and BRILORs).

In November 2011, at the start of the project, the government ran a simulation for response efforts along the entire stretch of the Coco River Watershed. Technicians from the Municipal Disaster Operations Center, Territorial Government and the project participated in the activities, and the exercise was used to simulate and train participants in evacuation and transportation techniques, prioritizing vulnerable groups, first aid to the wounded and the activation of the warning systems. The technicians estimate that 1,200 people from the communities participated. This simulation served the objectives of the project in that it permitted staff to assess the existing weaknesses in organization as well as where essential equipment and capacity was missing. Based on this assessment, the project was able to establish priorities and focus the intervention, particularly as regarded the radio and alert equipment for the EWS. The simulation confirmed the need for the project in the Lower Coco River zone as it highlighted weaknesses in the local emergency committee structure (not organized or very weak), lack of plans and maps in the majority of the communities, and missing or damaged communications equipment.

Evacuation and rescue simulation in the community of Klampa

As the project was implemented, additional simulations were run to re-test the capacity. The first seven communities ran simulations in November of 2012. Over 800 community members participated. The remaining 6 communities ran simulations in February 2013 with the participation of over 1,000 community members. The simulations included evacuation, rescue and first aid. For the most part, the great improvements were shown in the evacuation procedures and project staff was able to correct some planning deficiencies with regard to the loading of the evacuation boats.

Another test to the system was carried out during Hurricane Ernest, which passed close to the Northern Caribbean coast of Nicaragua in August 2012. The near-emergency served to validate the efficiency and capacity of installed equipment. The radio communication network that was installed and reinforced by the project in the communities along the Lower Coco River served to

monitor the conditions of the populations in the communities and to alert and inform them of the activities that were taking place on the part of SINAPRED and the Civil Defense in response to the possibility of being impacted by the hurricane. Although no one was evacuated, the early warning system served it role in providing updates and disaster risk prevention information, confirming its utility in these extreme events.

Indicator	Goal	Achieved
Percent of COMUPRED members and VAB staff receiving full leadership and risk management training curriculum.	**100%**	**100%**

An import goal of the project was the strengthening of human resources, both inside the communities as well as within the local branches of the government agencies and NGOs that serve them. As such, COMUPRED and Civil Defense staff were fully included in the training curriculums and the enthusiastic participation of these official contributed greatly to the project's effectiveness at the community level.

100% of the four municipal staff assigned to the COMUPRED participated in 100% of the project activities as did the two VAB technicians assigned to the project. CRS staff has been impressed by the energy and level of engagement of the COMUPRED staff, who have taken advantage of the project to increase their capacity, including updating their municipal response plans. As a result of this experience, the capacities of the local staff, including VAB, were strengthened in the following areas:

Radio communications and EWS workshop with Civil Defense in the community of Andris

- VAM Study (investigation and evaluation of community realities)
- Shelter Construction (bidding mechanisms, work supervision)
- Development of plans and community risk maps (updating techniques and methodologies, in some cases with new tools and knowledge)
- Simulations (improving evacuation techniques, SAT application, inter-institutional coordination)
- Radio communication network (requirements and system installation, equipment maintenance, communication techniques)

Indicator	Goal	Achieved
COMUPRED and VAB have the equipment and supplies necessary to fulfill their emergency response coordination and implementation roles.	**100%**	**100%**

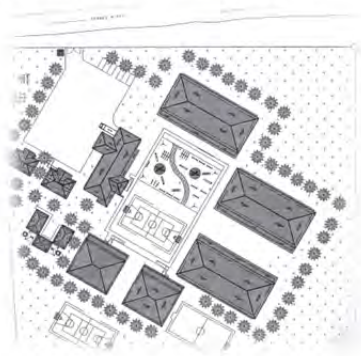
Evacuation and rescue simulation in the community of Raya Pura

While the strengthening of human capacity and organization was a key part of the project strategy to strengthen the local response, the supply of appropriate necessary equipment was also important. In order to ensure that the COMUPRED and VAB has the equipment, supplies, and infrastructure necessary to fulfill their emergency response responsibilities, the project provided the following material support:

- 1 50 ft aluminum boat
- 2 outboard motors
- 1 motorcycle
- Radio equipment
- Shelter infrastructure and plans
- Rescue equipment

The design and building of the customized evacuation boat and the construction of the shelter proved significantly challenging. The initial costs estimates for two boats, one large and one small were estimated expecting that local manufacturers would be able to supply the boats per the project's requirements. While fiberglass boats were available locally, partner staff and local emergency officials insisted that aluminum boats would be more appropriate, are more easily repairable and would last longer. While local manufacturers produce ocean going boats in aluminum, they were not able to supply a boat designed for the river. CRS investigated and obtained quotes nationally for boats in the specifications set by the project advisory council. Since the cost of producing and transporting a boat from a distant location was significantly more expensive than budgeted, in consultation with partners, CRS decided to combine the funds for the two boats and invest in a single large aluminum boat. Even so, the boat was more expensive than budgeted, but CRS was able to supplement the budget with private funds in order to complete the purchase.

With regard to the shelter, the initial proposal was to construct two separate structures for $80,000 each. In the original project proposal, CRS contemplated simple shelter structures for immediate emergency use. However, after in-depth consultations with the communities and with shelter experts within CRS, it was determined that the shelter should be prepared to accommodate evacuees for lengthier stays while flood waters remain. Also, in order to be in full compliance with Sphere standards, a more complete facility, with water, sanitary facilities, and cooking infrastructure, among other conditions, would be more appropriate in this context. This resulted in higher construction costs. In addition, general construction costs proved to be significantly higher than expected, partially as a result of steadily increasing fuel prices and the remote location. Contracting of a firm to



Shelter design for Kum

construct in the remote target area also proved difficult.

The Waspam Mayor's Office and the Territorial Government supported the shelter project in the form of a land donation (approximately 3.7 hectares) for the shelter site. Next, with the support of Seki Hirano, CRS Global Technical Advisor for Shelter and Settlements, terms of reference for shelter design were developed and published. CRS then had to reach out to several contractors order to encourage bids when only one bid was entered at the first deadline. Eventually, CRS received three bids and the design contract was awarded in June, 2012. The architect was instructed to develop three design options, including sand bag construction recommended by the CRS shelter advisor, and other lower cost construction options that would not compromise building strength or quality. This delayed selection of the final shelter design because the sand bag construction method had not been tried in Nicaragua. Ultimately, sand bag construction was declined because it had not been proven in excessively moist climates, and the architects and project staff were concerned about testing the technology with such a large investment. Instead, the project used a Save the Children-promoted technology of mixed cement and plaster.

Projected-constructed shelter dormitory in the community of Kum

The construction contract was then put out to bid, which again required CRS follow-up in order to get three competitors, and was awarded in November 13, 2012. Despite delays in the construction, due to a late start, weather difficulties, and ultimately political upheaval, the planned construction work concluded in May 2013. The final infrastructure includes two dormitories with a capacity to sleep 400 people, a fresh water well, 2 sanitary blocks (1 for men and 1 for women) that include 20 toilets and bathing space, a gray water septic system, electrical infrastructure, and a guard house.

In addition to the constructed infrastructure, CRS has left VAB and the municipality with complete design plans and budgets for additional dormitories, recreation spaces, kitchen, dining and storage facilities, and an additional well. The total construction cost was $187,000, $27,000 over budget. The cost overrun $27,000 was paid for by CRS private funds awarded by our regional office. Administrative management and maintenance of the facility is and will continue to be the responsibility of VAB with oversight on use and further development by the municipality. This is the first dedicated shelter in the area and will contribute significantly to the local capacity to shelter evacuees from the river zone. Strategically located in Koom, the site will significantly decrease evacuation costs saving 51 km of river transportation that formally carried evacuees to Waspam.

The project purchased and delivered emergency equipment for the ten members of the Damage Assessment and Analysis team, which is made up of technical representatives sent by various local institutions. The equipment will be managed by the VAB and distributed for emergency response use to the acting members of the team and includes: a life vest, rubber boots, binoculars, a rain poncho, a canteen, a whistle, a backpack, and a flashlight.

III. CONCLUSIONS AND LESSONS LEARNED

Despite significant challenges regarding some of the budgeted versus actual cost of the project, CRS was able to complete a high quality and impactful project that met it's established goals within the OFDA-awarded budget supported by an additional contribution from CRS of $28,300 to supplement the shelter construction and boat purchase budgets. Overall, the project cost OFDA $59.53 each per 9,030 beneficiaries.

While CRS's previous experience in the Lower Coco River basin prepared us for the enormous challenges our organization would face during the implementation of the program, certain obstacles proved to be particularly problematic. This included the difficulties in finding qualified consultants and contractors willing to work in the project target area at reasonable cost. Tenders for both construction and study proposals required additional outreach to encourage applicants, and in the case of the mapping training and study, adjustments had to be made to the budget and conditions of the contract. While CRS and VAB did eventually address and overcome these difficulties in order to deliver a successful project, these obstacles did delay the execution of several key activities

Moreover, political upheavals created additional project delays, particularly in shelter construction and the mapping exercises. These events included municipal elections in November of 2012 and another instance shortly thereafter when local protests about costs and regional autonomy erupted, paralyzing transportation and supply routes. As a result, CRS required a 60-day extension to compete the shelter and even then was pushed to the wire in order to complete the shelter by the end of the project period.

Radio communications center with solar panel in the community of Plankira

In addition to the increased human resources capacities, organization, and infrastructure to mitigate, prepare for and respond to flooding and hurricane hazards left in place by the project, the project has also laid important ground work in the form of shelter designs and budgets to further increase local capacity to shelter flood victims. Additionally, the VAM study provides many initial steps and considerations for the potential relocation of at least some of the communities. While further work is required within the communities to develop the will and a locally acceptable way to transition to population to a safer living environment that also meets their requirements for livelihood activities, the goals and objectives of the present project were successfully met and a solid base has been forged from which to build further activities to mitigate the chronic risk and to forge a higher quality of life for the inhabitants of the Lower Coco River.