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Emergency Appeal Final Report

Cuba: Hurricane Irma



Emergency Appeal n° MDRCU004	GLIDE n° TC-2017-000132-CUB
Date of issue: 13 December 2019	Date of disaster: 9 September 2017
Operation manager: Raphael Hamoir – Disaster Management Coordinator	Point of contact: Luis Foyo, Executive President of Cuban Red Cross (CRC)
Operation start date: 15 September 2017	Operation end date: 15 June 2019 (21-month timeframe)
Overall operation budget: 9,760,347 Swiss francs (CHF). Appeal Coverage	
Number of people affected: 10 million (90 per cent of the island affected)	Number of people assisted: 48,885 people (9,777 families) - 24,931 women and 23,954 men -.
Host National Society presence (number of volunteers, staff, and branches): Cuban Red Cross (CRC) has one central/national headquarters, 46,851 volunteers, 481 staff members and 1,348 branches.	
Red Cross Red Crescent Movement partners actively involved in the operation: International Federation of Red Cross Red Crescent Societies (IFRC), International Committee of Red Cross (ICRC), Canadian Red Cross, Spanish Red Cross, Ecuadorian Red Cross and Peruvian Red Cross.	
Other partner organizations actively involved in the operation: Civil Defence, Government Ministries (Health, Commerce, Energy, Housing), Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG-ECHO), United Nations Programme Development Programme (UNDP), United Nations Population Fund (UNFPA), United Nations Office for the Coordination of Humanitarian Affairs (OCHA), Pan American Health Organization (PAHO), United Nations Children's Fund (UNICEF), United Nations Industrial Development Organization (UNIDO), United Nations Food and Agricultural Organization (FAO) and the World Food Programme (WFP).	
On behalf of Cuban Red Cross, the IFRC thanks the following contributors to this Emergency Appeal: American Red Cross, Andorran Red Cross, Australian Government, Belgian Federal Government, British Red Cross (from British Government), Canadian Government, Canadian Red Cross, China Red Cross (Hong Kong Branch), Cyprus Red Cross, Czech Government, Danish Red Cross, Delta Airlines Inc, ELMA Relief Foundation, Elsevier (Reed), Estonia Government, European Commission - DG ECHO, Fondation Trafigura, IFRC at the UN Inc, Japanese Red Cross Society, Mondelez International Foundation, Norwegian Red Cross (from Norwegian government), Pfizer Inc, Red Cross of Monaco, Republic of Korea Government, Spanish Red Cross, Swiss Government, The Netherlands Red Cross, The Netherlands Government, Tonga Red Cross Society, Ultimate Software Group, Western Union Foundation.	
The response operation for Hurricane Irma in Cuba ended on 15 June 2019, with a balance of 1,290,956 Swiss francs (CHF) . The Cuban Red Cross, with support from IFRC, designed a plan of action for the remaining funds proposing complementary activities to strengthen risk preparedness and mitigation activities as well as contribute to capacity building based on lessons learned from the operation. The <i>country plan</i> and the <i>strengthening of the disaster management regional system</i> will be implemented in the following areas of intervention: Disaster Risk Reduction, Shelter, Strengthening of Institutional capacities, and Strengthening the regional response mechanisms (for further information see section <i>Continuity of the operation and country plan and strengthening of the disaster management system</i> at the end of the report).	

[<Click here to view the final financial report and here to view contact details>](#)

A. Situation Analysis

Description of the Disaster

Hurricane Irma made landfall in Cuba as the first category 5 hurricanes since 1924, with sustained winds of up to 270 km/h from 8 to 10 September 2017. The cyclonic storm surge caused by heavy rains penetrated almost two km inland, which led to severe flooding in parts of the country. In anticipation of the impact, local authorities evacuated nearly a million people as a preventive measure, which contributed to limiting the loss of life - ten deaths reported.

According to posterior assessments, the strong winds, heavy rains, and resulting coastal flooding affected 158,554 dwellings (14,657 destroyed, 16,646 partially damaged, 23,560 lost roofs and 103,691 suffered damage to roofs). Also, the hurricane damaged 980 health institutions, 2,264 educational centres, 466 poultry farms and 95,000 hectares of cultivated land, as well as telecommunications systems (246,707 landlines and 1,471 data points) and 537 km of roads. At least 3,100,000 people were left with no electricity and water at the beginning of this event.

Hurricane Irma caused a total of 13,500 million Cuban pesos (500,772,288 CHF) in damages, the costliest cyclonic event in Cuba's history.

Summary of response

Overview of Host National Society

At the beginning of the operation, Cuban Red Cross (CRC) adapted its structure and activated 12,182 volunteers to respond to the emergency and assist with activities under the Plan of Action, including distribution of household items, sanitation activities, epidemic control, coordination with national, province and municipal authorities, monitoring delivery and proper use of donations, restoring family-links and training workshops. Due to the level of damage, the Cuban Red Cross mobilized its staff to focus on the operation entirely.

The personnel involved in the emergency operation worked in the seven provinces affected by Hurricane Irma: Holguín, Ciego de Ávila, Las Tunas, Camaguey, Villa Clara, Matanzas and La Habana.

Through its auxiliary role to public authorities, CRC coordinated the following humanitarian assistance activities with province, municipal and community entities from the moment Hurricane Irma hit the island:

- Joint identification of community needs with the population affected by Hurricane Irma.
- Coordination with central government agencies, including province and municipal governments.
- Training workshops on topics such as roof repair and tent assembly, in collaboration with the government.
- Provision of tool kits to government construction brigades.
- Support to construction brigades tasked with building temporary facilities.
- Hygiene promotion training to the affected population.
- Restoring Family Links
- Participation in and guidance and support to psychosocial studies for those affected by Hurricane Irma.
- Logistics to transport aid from the port of entry to end beneficiaries
- Ongoing review and updating of beneficiary lists based on real-time needs.
- Coordination of monitoring visits on behalf of donors and IFRC



Photo 1: CRC Volunteers distributing water tanks to the affected communities.
Source CRC: 2018.

- Weekly plan of action review meetings

Temporary work groups and roofing brigade system

Considering that the greatest damage caused by the hurricane was to roofs and based on the experience gained from the Hurricane Sandy response, CRC conducted a national roofing workshop for volunteers and government officials in order to teach them to install roofs.

The process was faster and more efficient in locations with a more significant presence of CRC volunteers who had been previously trained as part of Hurricane Sandy response efforts. In places with fewer CRC volunteers, the responsibility for developing the strategy to distribute the roof kits, tool kits, and zinc sheeting based on the beneficiary selection fell to local government. Local governments formed roofing brigades made up of local technicians and community residents to oversee the roofs' installation, which was done according to IFRC guidelines and instructions provided during workshops and with support from shelter specialists and the Regional Intervention Team (RIT) members hired for the operation.

The roofing brigades formed was involved during the response and the recovery phases of the operation. During the emergency phase, the government included its staff in responding quickly with the reparations. Once the government closed the emergency phase, government roofing brigades became less available, and their actions more limited as the workers were assigned to other government tasks. It is also important to mention that the individuals who installed the roofs were not always the same ones who attended the training sessions, so the transfer of knowledge to brigades was slow and not entirely efficient. This delayed the installation process, and in some cases, the operation's shelter experts had to make technical corrections. Nonetheless, this entire process led to a very interesting appropriation of knowledge and leadership by end beneficiaries, who have learned the importance of having safe roofs and, for some, how to lead roofing brigades or install their roofs.

The CRC, in coordination with the government, distributed several emergency items with support from the roofing brigade system, which at this stage acted as volunteers. At the request of the Ministry of Public Health, CRC also distributed items (mosquito nets, water tanks, bedding) to ensure the continued functioning of some health system institutions.

Shelter kits helped to provide a temporary shelter solution for affected families. Since these items were also delivered to public institutions, they were used to rebuild various public institutions (hospitals, schools) and public spaces (parks, squares, etc.).

Overview of the Red Cross - Red Crescent Movement in the country

IFRC pre-deployed surge staff to Cuba before the impact of Irma, and the team in the field was later reinforced through support from the Country Cluster (Haiti, Dominican Republic, and Cuba) and IFRC's Americas Regional Office (ARO). The National Society liaised with the Cuban Government and relayed information to IFRC, thus preparing the Plan of Action based on identified needs. Periodic operational monitoring and support visits began to be conducted since early 2018, including workshops, high-level visits, and provision of technical support in the field.

The IFRC supported the response of the Cuban Red Cross with the publication of an Emergency Appeal on September 15, 2017, with an initial budget of approximatively 7 Million CHF.

IFRC also provided support and guidance to the National Society and government authorities to advance with negotiations to obtain long-term visas for delegates supporting the operation. Obtaining such long-term permits proved difficult and limited more widespread presence of Delegates. Short-term missions limited the overall capacity to assist the Cuba Red Cross technically.

ARO, with support from the Cuba-Dominican Republic-Haiti Country Cluster office, shared official information provided by CRC with all Movement members. In addition, CRC led coordination meetings at the country level with the Spanish Red Cross, Canadian Red Cross and Norwegian Red which mobilized personnel to support the National Society.

In February 2018, the IFRC Secretary General, the Regional Director and the Head of the Country Cluster Support Team held a high-level visit in the country.

In August 2018, British Red Cross visited the island to monitor progress, especially in targeted areas in which British Red Cross' contribution has had the greatest impact. During this visit, British Red Cross had the opportunity to interact with

various stakeholders (beneficiaries, CRC partners, the Cuban government and IFRC delegates) and make recommendations to improve the implementation of the operation and well-being of the affected population.

The operation enabled CRC to establish closer ties with Partner National Societies, as was the case with Canadian Red Cross, which did not have a presence in Cuba prior to this event. As a result of IFRC's collaboration and negotiations, and with CRC's endorsement, the Canadian Red Cross formalized a cooperation agreement to develop programmes that will give continuity to what has been done during these last two years.

It is important to highlight that the Canadian Red Cross deployed to Cuba since the beginning of the Hurricane Irma response and participated in several phases of the design and implementation of the Plan of Action, including the distribution of household items in communities. This allowed a better understanding of the Cuban context and, therefore, better coordination with the National Society and with authorities.

Spanish Red Cross provided monitoring and technical support to shelter activities since the beginning of the operation. Visits to CRC national headquarters and activities in affected provinces were scheduled to facilitate the reporting process and make recommendations aimed at the operation's continuous improvement.

Canadian Red Cross and Spanish Red Cross contributed to the Lessons-Learned workshop organized in Havana in May 2019.

Overview of non-RCRC actors in the country

Following the impact of the hurricane, the government organized an immediate response strategy that involved the organizing of temporary working groups under the direction of the Cuban National Defence Council. These groups, in which all stakeholders involved in the operation's emergency and reconstruction phases participated, were replicated at the provincial and municipal levels. The Cuban government had a definitive role in this process since it was the government who supervised the transport of these items to affected provinces and municipalities once the emergency aid arrived in the country. This was done through Empresa Universal and Scambray, which are state-authorized companies. There is a protocol in place that dictates that all aid is to be collected in a national collection centre, and from there transported to provinces and then to municipalities. Once this aid arrives at the site, the government organizes specialized brigades according to thematic groups to distribute it.

The European Civil Protection and Humanitarian Aid Office (ECHO) was one of the most important partners and donors during the operation. Periodic visits to the field were coordinated with IFRC, CRC, and the Government to monitor progress and make recommendations on how to improve the process. This guidance and support were crucial for the operation, as allowed direct accountability during the process and ensured better and more effective aid delivery.

Coordination was also established with other humanitarian actors in the field, as was the case with UNDP and OXFAM, which allowed complementarity and prevented duplication of activities. Cuban Red Cross and IFRC wish to take this opportunity to send a message of appreciation to all these organizations, thanks to which the operation took place under the best possible conditions.

Needs analysis and scenario planning

The information provided by various entities, such as the Cuban government, the United Nation's Office for the Coordination of Humanitarian Affairs (UNOCHA), ECHO and CRC allowed having by-sector analyses:

Health

Given that most of the damage was to infrastructure, a large number of health institutions were affected. The Ministry of Public Health, in conjunction with the Pan American Health Organization (PAHO), had reported 1,026 affected health facilities. All have been repaired and are currently functioning correctly. The plan of action helped to strengthen the national health system through delivering emergency supplies (bedding, mosquito nets) to the most affected locations, as well as contributed to their proper functioning through the delivery of water tanks and spare parts for the system's fleet (tyres). The goal was to contribute to public health efforts.

Water and sanitation

All damage to water pumping systems in affected provinces was repaired by authorities, and both the national electricity system and the water pumping systems have been fully restored. Although infrastructure was fully repaired, some people

still have limited access to these services, which makes it necessary to continue to help CRC to enhance access to drinking water and raise communities' awareness regarding hygiene promotion.

Shelter

According to Government reports, 158,554 dwellings were affected: 14,657 were destroyed, 16,646 suffered severe damage, 23,560 lost their roofs and 103,691 suffered partial damage. In response to this situation, the government announced that the State would be subsidizing 50 per cent of the price of construction materials sold to people whose homes had been destroyed or severely damaged. Likewise, 50 per cent of the current retail price of primary consumer goods was subsidized for the affected population, including mattresses, hygiene products, kitchen equipment and household appliances. Some items were 100 per cent subsidized in cases of dire need. Red Cross was asked to contribute with immediate assistance to help families recover their household items.

Municipal Defence Councils in affected areas instructed state agencies and companies - organized into brigades - to repair the homes of those affected, especially focusing on low-income individuals, people with disabilities, elderly, mono-parental families and other vulnerable populations. Roofing materials were distributed based on the damage suffered, which was determined by Municipal Defence Commissions based on assessments of affected families. Fiberglass, zinc and asphalt roofing materials were delivered to families with damaged roofs, devoting national production to that purpose. The same method was used for doors and windows, and other materials, such as nails, were provided to fix roofs. The Defence Council was tasked with organizing this process, from conducting the assessments to calculating the amount of materials to be allocated per affected household.

Below is a list of communities in which the plan of action was implemented. Aid recipients were selected in full coordination between Cuban Red Cross and local authorities based on vulnerability criteria promoted by the National Society.

Province	Municipality
La Habana	Habana del Este
	Habana Vieja
	Centro Habana
	Plaza
	Playa
Matanzas	Martí
	Cárdenas
	Matanzas
	Los Arabos
	Unión de Reyes
Camagüey	Sierra de Cúbitas
	Florida
	Nuevitas
	Esmeralda
Las Tunas	Jobabo
	Manatí
	Jesús Mendez
	Puerto Padre
Holguin	Gibara
	Frank Paí
	Banes
	Mayarí
	Rafael Freyre
Villa Clara	Encrucijada
	Caibarién
	Sagüa la Grande

	Santo Domingo
Ciego Ávila	Bolivia
	Moron
	Chambas
	Venezuela

Operation Risk Assessment

During the Hurricane Irma response phase, Cuba experienced other events, such as Storm Alberto, Hurricane Michael, Tornado F4, and the holiday season, which disrupted the implementation of operational activities. The Cuban Government and CRC faced the challenge of having to prioritize the allocation of personnel and resources to address the impact of these events.

2018 Hurricane Season

Subtropical storm Alberto

- Impact on public transport and railways

Since trains were the primary means of transporting humanitarian aid on the island, the suspension of railway services delayed aid delivery. The CRC, with support from the government, managed to send some relief items in trucks despite road closures, which allowed CRC to continue with its Hurricane Irma work plan as well as respond to the impact caused by Alberto in the areas that had been previously affected by Hurricane Irma.

- Changes in priorities and additional damage caused by Alberto.

Local authorities, including CRC per its auxiliary role, focused their efforts on addressing the impact of Alberto. In provinces such as Villa Clara, Alberto caused damage to dwellings (64 homes destroyed and 138 partially destroyed), agriculture, and road infrastructure. More than 16,000 people in this province were evacuated from their homes.

With CRC's support, local authorities prepared a new distribution plan that considered Alberto's impact on the area and the most vulnerable communities affected by both events. The government's response focused on restoring and recovering the livelihoods affected by the storm to ensure basic needs and sustainability, which made it challenging to implement the plan of action.

Hurricane Michael

The rapid evolution of Hurricane Michael led to the issuance of a hurricane alert for the province of Pinar del Río and the special municipality of Isla de la Juventud on 8 October 2018. The response launched to deal with this event in affected provinces is already in the recovery phase.

Entire municipalities in western Cuba were left without electricity in the wake of Michael, a category 1 hurricane that crossed the Yucatán Channel near Cabo de San Antonio. Electrical and communication services were disrupted in the municipalities of Sandino, Mantua, Guane and Minas de Matahambre in Pinar del Río due to downed poles and tree damage to power lines. The more than 100 millimetres of rainfall dumped by the storm caused flooding in vast areas of the province. In terms of agriculture, the hurricane damaged tuber plantations, warehouse roofs, tobacco curing houses and tunnels used as tobacco and vegetable seedbeds.

Tornado F4

On 27 January 2019, a tornado unexpectedly hit the capital city with extreme winds that damaged some 3,500 homes, mainly in the province of La Habana. According to initial reports, the most industrial part in La Habana was directly impacted by the event resulting in adverse effects on the national economy.

Responding to the tornado implied that the Cuba Red Cross had to temporarily reassign human resources from Irma Operations to the Tornado F4 response operation. CRC deployed its volunteers in the province of La Habana to support the response coordinated by the Cuban government. Response teams from neighbouring provinces were also deployed to

assist the affected population, in compliance with orders issued by the government that instructed that all possible resources be used to restore essential services as soon as possible - 100 per cent of the power grid had been restored six days after the tornado.

Following the occurrence of this event, a DREF for 71,911 CHF was approved on 18 February 2019 for three months, initially aiming to assist 300 families affected by the tornado.

B. OPERATIONAL STRATEGY

Proposed strategy

The CRC's strategy focused on the affected population's recovery through its main objective of repairing and installing roofs, which was guided by the Participatory Approach to Safe Shelter Awareness (PASSA) and technical training on roof repair. It also included delivery of water tanks; holding hygiene promotion workshops for the affected population, government officials and CRC volunteers; delivery of household items; and updating of emergency response contingency plans at the municipal, provincial and national levels.

As part of CRC's institutional strengthening, the National Society also supported IFRC processes and methodologies such as Organizational Capacity Assessment and Certification (OCAC); the Well-Prepared National Society methodology; the development of an institutional action plan; and the Branch Organizational Capacity Assessment process at regional and local levels. With IFRC's support, the National Society carried out a BOCA training of trainers (ToT) for volunteers and is currently adapting the tool to the Cuban context.

Human Resources

IFRC supported the operation through its Country Cluster Support Team for Haiti, the Dominican Republic and Cuba; deployment of Regional Intervention Teams (RITs) specialized in shelter solutions; and the hiring of a consultant responsible for making recommendations and monitoring and supporting implementation in the seven affected provinces until the end of the operation.

In addition, the operation hired an Operations Manager to be responsible for keeping in permanent contact with CRC to coordinate all support from IFRC; a senior PMER officer to be responsible for the operation's monitoring, evaluation and reporting, who made periodic monitoring visits for reporting purposes; as well as a senior finance officer, to assist with financial aspects of the plan of action during the last six months based in Santo Domingo.

CRC conducted a final evaluation of the operation to analyse whether it had met its objectives and to gather lessons learned. An external consultant was hired to conduct the final evaluation that took place from 27 to 29 May in La Habana, the final report will be published soon.

Permanent Cuban Red Cross staff was responsible for implementing the response operation at the national headquarters and province levels. The National Society was unable to increase its human resources by hiring additional personnel due to the labour doctrine in force in Cuba.

Logistics and supply chain

The objective of logistics activities was to handle the supply chain efficiently, including implementation, procurement, customs clearance, fleet, and warehousing and transportation to distribution points, based on operational needs and standards and following IFRC processes and procedures. The process of acquiring and transporting humanitarian aid items required considerable efforts, given Cuba's restrictions on international trade and the fact that it is mandatory to use authorized shipping companies with active operations in the country. Despite these restrictions, the national government facilitated the process of securing the necessary authorizations from various government ministries to release the shipments arriving in the country. Nonetheless, delays in the arrival of goods to the island caused significant delays to the implementation, which led to having to request two extensions for the operation.

The initial strategy for the arrival of shipments was to deliver the goods at the country's two most important ports (Mariel and Santiago de Cuba) to expedite the implementation process. However, due to several situations that arose during the operation, most of the shipments had to be routed to Mariel, which required additional land transport actions, which once more led to delays in deliveries.

Below is a list of the items shipped to Cuba during this Appeal:

MDRCU004 - OPERATION CUBA						
Item	Quantity	Date of Approval	Date of Import Approval	Date of Delivery	Date of GRN	Origin of Shipment
DELIVERED						
Plastic buckets	1,404	22-Sep-17	22-Sept-01	23-Sep-17	30-Oct-17	Panama Spain Canada
Collapsible 10-litre jerrycans	3,000			23-Sep-17		
Light blankets	2,500			23-Sep-17		
Plastic tarpaulins	2,500			23-Sep-17		
Mosquito nets	7,002			23-Sep-17		
Kitchen kits	3,295			23-Sep-17		
Tool kits	1,500			23-Sep-17		
Hygiene kits	3,049			23-Sep-17		
Aquatabs	160,000			23-Sep-17		
Vehicle	1	29-Nov-17	20-Apr-18	15-May-18	22-May-18	Panama
Tyres	100	1-Feb-18	20-Feb-18	8-Apr-18	21-Apr-18	Panama
Bedding	10,000	5-Feb-18	23-May-18	29-Jun-18	24-Jul-18	Panama
250-litre water tanks	2,000	20-Nov-17	6-Mar-18	4,000 pcs 24-April 1,000 pcs 7-May	22 - May / 11-Jun	Colombia
Plastic tarpaulins	4,000	23-Nov-17	15-Dec-18	28-Mar-18	11-Jun-18	St. Marteen
Tool kits	400		15-Dec-18	28-Mar-18	11-Jun-18	
Work gloves	500	8-Feb-18	30-Apr-18	28-May-19	24-Jul-18	Panama
ROOF REPAIR KITS						
Roof repair kits	2,000	23-Oct-17	5-Feb-18	16-May-18	22-May-18	Mexico
Roof repair kits	2,000	21-Dec-17	20-Feb-18	8-Aug-18	15-Aug-18	Mexico
Roof repair kits (ECHO)	1,430	1-Feb-18	20-Feb-18	2-Aug-18	15-Aug-18	Mexico
Roof repair kits	570	17-May-18	30-Oct-18	11-Nov-18	12-Jan-19	Panama
MOTOR VEHICLES						
Vehicles	3	26-Jan-18	27-Sep-18	18-Oct-19	19-Nov-19	Dubai
Truck	1	27-Mar-18	13-Sep-18	18-Oct-19	19-Nov-18	Panama
Motorcycles	3	19-Dec-17	13-Sep-18	1-Nov-19	5-Dec-18	Panama
Spare parts (cotter pins, pulleys, bolts, seal)	6	30-May-18				Panama

Challenges in terms of logistics


- ✓ Delays in import authorizations: cargo import authorizations can take from two days (as was the case for the second and third order of roofing sheets) to more than eight months (in the case of vehicles).
- ✓ Coordination with the supplier for the first three orders of roof kits (zinc sheets and tools) was difficult.
- ✓ Coordination of inspections of goods.
- ✓ Release of Bills of Lading (BLs) and cargo in Cuba.

Challenges in terms of procurement

- ✓ Availability of construction material in Cuba is limited; therefore, most of it had to be sourced internationally in order to meet quantitative objectives.

- ✓ A regional supplier with previous experience providing similar products to Cuba was selected. However, the supplier failed to meet the agreed delivery dates, alleging logistical and customs issues at the port of origin. Once the supplier delivered the products, the late delivery penalty clause was enforced with support from IFRC's Legal Department. IFRC is still in discussions with the supplier in order to establish the final penalty amount.

C. DETAILED PLAN OF ACTION

 Disaster Risk Reduction People reached: 0		
DRR Outcome 1: Communities in high risk areas are prepared for and able to respond to disaster.		
Indicators:	Target	Actual
2,000 people served through Cuban Red Cross DRR and community preparedness programmes	2,000	0
DRR Output 1.1: Communities take active steps to strengthen their preparedness for timely and effective response to disasters.		
Indicators:	Target	Actual
2,000 people reached through public education campaigns that use harmonized messages to reduce, mitigate and respond to identified risks.	2,000	0
<i>Narrative description of achievements</i>		
Activities planned under this component could not be carried out. This component was therefore removed from the Plan of Action and included in the Country Plan.		
<i>Challenges</i>		
<p>Although the CRC managed to obtain a contract with a printer, there were problems with the printing machines and accessibility of spare parts and consumables, and the order had to be cancelled.</p> <p>The CRC considered the possibility of printing these materials abroad. However, due to the large number of materials required and the extensive procedures to import, this activity was cancelled.</p>		
<i>Lessons Learned</i>		
<p>During the planning phase of operation, options could be considered for disseminating non-printed messages since printing costs in Cuba are high, and the production and distribution of printed materials depend mainly on government plans. Options to explore include radio and TV campaigns or even spokespersons in communities.</p> <p>The content of messages to be disseminated should rely on existing initiatives carried by the Cuban authorities and adapted to the context for disaster and climate change-related subjects.</p>		



Shelter

People reached: 48,885

Female: 24,931

Male: 23,954

Shelter Outcome 1: Communities in disaster and crisis affected areas restore and strengthen their safety, well-being and longer-term recovery through shelter and settlement solutions.

Indicators:	Target	Actual
7,000 families reached with adequate shelter and settlement solutions	7,000	9,777

Shelter Output 1.1: Short, medium and long-term shelter and settlement assistance is provided to affected households.

Indicators:	Target	Actual
5,000 families receive NFIs	5,000	5,000
7,000 have been provided with safe, adequate and durable shelters.	7,000	9,777

Shelter Output 1.2: Technical support, guidance and awareness raising in safe shelter design and settlement planning and improved building techniques are provided to affected households.

Indicators:	Target	Actual
7,000 people receive adequate technical support and guidance	7,000	9,777
21 volunteers receive technical training in safe shelter and roof repair	21	23

Narrative description of achievements

Development of a beneficiary selection and registration strategy to deliver humanitarian aid.

In coordination with the Spanish Red Cross and IFRC, CRC headquarters staff visited affected areas to identify potential people targeted in the communities. CRC carried out the people selection process with support from the National Society. State social workers, together with CRC staff, conducted social assessments to identify communities. During this process, the Cuban Government, with support from CRC, analysed each case involving damaged housing to determine the type of assistance to be provided. Those identified as most vulnerable received humanitarian aid depending on their socioeconomic status, and those with the means to access other resources received other types of assistance, such as grants or loans under special payment terms. Additional people to be reached (2,000 families) were included under this Appeal after the second update. The CRC conducted a similar process to identify and register them. Based on identified needs, 5,062 target families (780 in Matanza, 524 in Villa Clara, 1,614 in Ciego de Ávila, 1,057 in Camaguey, 640 in Las Tunas and 987 in Holguín) were identified to receive zinc sheets, roof kits and tool kits.

Purchase and shipping of 1,900 tool kits

A total of 1,900 toolkits were provided by the Canadian Red Cross (500), IFRC (1,000) and Dutch Red Cross (400) for the operation according to IFRC standards, which were delivered to government construction brigades working in affected communities. These have had a positive impact on both people to be reached and brigades, since they were used in multiple tasks that contributed to the reconstruction process (such as repairing homes, public institutions, medical centres, schools and tourist infrastructure). CRC decided not to acquire more tools given that other organizations were providing similar ones.

Besides, the roof repair kits included in the new revised version of the EPoA contained tools as well. Nevertheless, Dutch Red Cross provided 400 additional kits, which CRC distributed in La Habana (100), Ciego de Ávila (200) and Las Tunas (100).

Purchase and shipping of 6,500 tarpaulins

A total of 6,500 tarpaulins were distributed (1,000 from the Canadian Red Cross, 1,500 from the IFRC and 4,000 from the Dutch Red Cross).

Purchase and shipping of 3,314 kitchen kits

A total of 3,314 kitchen kits were distributed, 500 received from the Canadian Red Cross, 2,000 from the Spanish Red and 814 from the IFRC.

Purchase and shipping of 20,000 bed sheets

A total of 20,000 bed sheets arrived in Cuba, which were delivered to the National Health System. The CRC participated in the distribution to various institutions.

The first shipment of 10,000 sheets arrived in the country on 13 July 2018 and the second shipment of 10,000 sheets arrived on 17 May 2019, both through Puerto Mariel. The table below describes the distribution to various health institutions:

SHIPMENT 1 (5/7/2018)		
No.	INSTITUTION	# OF SHEETS DELIVERED
1	Hospital Hermanos Ameijeiras	550
2	Hospital Oncológico	1,200
3	Hospital Nacional Cardiológico	800
4	Hospital Pando Ferrer	450
5	Hospital clínico quirúrgico Ciro Redondo	3,000
6	Hospital Provincial clínico quirúrgico Ciro Redondo	1,000
7	Hospital provincial Saturnino Lora	1,500
8	Hogar de Anciano Mario Muñoz	550
9	Hospital clínico quirúrgico Juan Bruno Zayas	950
TOTAL		10,000

SHIPMENT 2 (1/4/2019)		
No.	INSTITUTION	# OF SHEETS DELIVERED
1	Hospital provincial materno infantil Justo Legón Padilla	400
2	Hospital Comandante Pinares	400
3	Hospital clínico quirúrgico Salvador Allende	2,300
4	Hospital provincial San José	400
5	Hospital clínico quirúrgico provincial Matanzas	300
6	Hospital clínico provincial Cienfuegos	500
7	Hospital clínico provincial Villa Clara	1,100
8	Hospital clínico provincial Ciego de Ávila	600
9	Hospital clínico provincial Camagüey	600
10	Hospital clínico provincial Las tunas	500
11	Hospital clínico provincial Holguín	1,300
12	Hospital clínico provincial materno sur	900
13	Hospital clínico provincial Agosthino Neto	700
TOTAL		10,000

Monitoring and evaluation of relief activities and submission of distribution reports

With the Spanish Red Cross's support, the CRC visited the affected provinces in October 2017. Since then the CRC maintained communications with the affected CRC branches, and its headquarters verifying and validating the distributions, e.g. reviewing signed people reached lists.

The CRC held regular meetings with the provincial and municipal authorities involved in the operation to update on the progress and communities reached with relief items. Monitoring visits were organized on several occasions by the Spanish Red Cross in order to monitor the implementation of activities.

IFRC supported the monitoring process with the Regional Shelter focal point and the deployment of Shelter RITs to Cuba.

The Cuban Red Cross implemented monitoring tools at branch and headquarter level in order to best monitor and report on the implementation rate of the operations.

Identification of specific communities and beneficiaries in coordination with local government authorities

A temporary working group was established as per the Cuban government system at the various State levels (national, provincial, and municipal) to carry out the people to be reached the selection process.

Aid delivery was initially planned based on the impact caused by Hurricane Irma; however, this process underwent several changes due to governmental decisions and external factors such as Subtropical Storm Alberto and Hurricane Michael. Selected families included those affected by the hurricane and other storms in the areas previously affected by Irma.

Deployment of Shelter focal point

The regional risk management coordinator and ARO's shelter coordinator made periodic visits since the beginning of the operation to help prepare the Plan of Action and for monitoring purposes. In addition, two Shelter RITs were deployed from IFRC to tour all affected provinces and analyse progress with and quality of roof installations. Continuous monitoring revealed the need for further technical monitoring visits to ensure the required progress and quality.

A Shelter consultant was hired at that time to support the CRC and roofing brigades, provide technical recommendations and speed up the process. The consultant, who worked for the remainder of the operation, made periodic monitoring visits to make recommendations for improvement and provide technical advice regarding installation.

Purchase and distribution of roof repair materials to rebuild 7,000 damaged roofs (350,000 zinc sheets and installation materials)

A total of 6,036 roof repair kits and 299,300 zinc sheets arrived in the country since the beginning of the operation. Extensive negotiations were conducted with shipping companies from Mexico and Panama to secure space in weekly shipping containers.



Photo 2: IFRC monitoring visit of the repaired roofs in the Minas Community, Camagüey, Municipality. Source: IFRC 2019.

9,777 families were benefited with shelter solutions, exceeding the original target number of families (7,000) set by 39.7%.

The following table shows all items shipped and received, the number of roofs installed and the percentage of progress as of the Appeal's end date:

Zinc Sheets							
Province	# of sheets received in province	Families to be benefitted	# of roof kits	# of roofs installed	# of roofs yet to be installed	# of certified roofs	% of progress
Matanzas	22,239	671	684	562	109	555	84%
Villa Clara	37,720	1,404	546	1,389	15	1,389	99%
C. Ávila	94,492	2,925	1,582	2,925	0	2,925	100%
Camaguey	68,141	2,339	1,298	2,339	0	2,339	100%
Las Tunas	31,072	1,056	706	1,056	0	1,056	100%
Holguín	45,636	1,533	1,220	1,513	20	1,513	99%
TOTAL	299,300	9,928	6,036	9,784	144	9,777	98.5%

CRC distributed 299,300 zinc sheets in targeted provinces, reaching 9,777 families (roofs that met the standard). CRC identified vulnerable groups within these beneficiary communities: 4,383 children under 15, 4,471 individuals over 60, and 1,019 individuals with disabilities. As of the end date of the operation, there were 144 roofs pending installation due to delays by the government in building the structures on which they were going to be installed.

An average of 50 zinc sheets was to be provided per family according to estimates made at the beginning of the operation; however, an average of 30 zinc sheets was ultimately delivered per family based on needs and per coordination by CRC and the government.

6,036 roof kits were distributed in targeted provinces to complement zinc sheets. Some were distributed to roofing brigades to install roofs but were also used to rebuild other infrastructures such as hospitals, schools, public parks, and government institutions. The Cuban government acknowledged and highlighted the superior quality of roofing in comparison to that offered by other humanitarian actors.

Shelter Kits	
Province	# de kits distributed
Matanzas	684
Villa Clara	546
C. Ávila	1,582
Camagüey	1,298
Las Tunas	706
Holguín	1,220
TOTAL	6,036

The Spanish Red Cross appointed a delegate to support in-country, supervise and monitor roof repairs, while IFRC deployed two RITs to support and monitor all shelter-related activities during one month as well as a shelter expert who visited all seven affected provinces to provide support and make recommendations to housing technicians and roofing brigades. A technical guide for correct installation and certification of safe roofs was prepared (see [Annex 1 & 2](#)). The Ministry of Housing was the entity in charge of certifying roofs, with support from CRC.

Roof repair workshop to technicians

22 CRC and Ministry of Housing staff members (77% male and 23% female) in target provinces participated in the roof repair workshop for technicians held in January 2018. Although the EPoA included only one national workshop and community workshops, CRC, in coordination with the Spanish Agency for International Development Cooperation (AECID), carried out complementary roof repair workshops in provinces and municipalities.

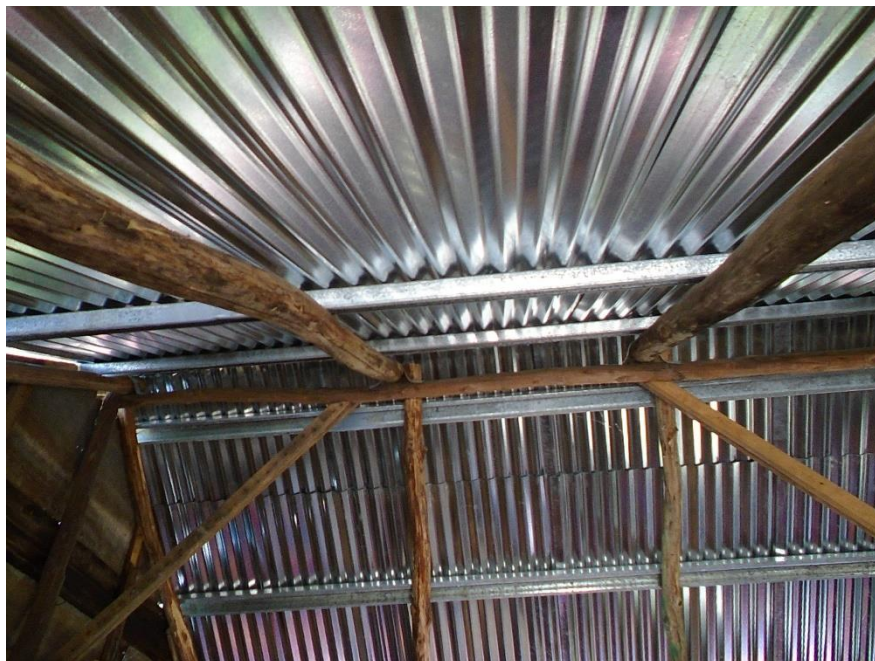


Photo 3: Repaired roofs example in the Minas community, Camagüey Municipality. Source IFRC:2019

Community home repair workshops

Technicians and housing specialists from affected provinces replicated the knowledge they acquired in the national workshop in municipalities and people's councils. These included members of roofing brigades, CRC volunteers, and municipal government staff. The latter shared the guide prepared by IFRC in all beneficiary communities, so brigades' work was complemented with correct roof installation and repair techniques.

Participatory Approach to Safe Shelter Awareness (PASSA) workshop and activity implementation workshop

The PASSA workshop was developed in La Habana from November 25 to December 1, 2018. It had 23 participants from the CRC, the Ministry of Housing, and the IFRC. The participants' provinces were Pinar del Rio, Artemisa, La Habana, Mayabeque, Matanzas, Cienfuegos, Villa Clara, Ciego de Avila, Camaguey, Las Tunas, Holguin, Granma, Santiago de Cuba, and Guantanamo.

The PASSA methodology was going to be rolled out in the Province of Ciego de Avila in the first semester of 2019 but has been rescheduled as an activity of the Country Plan.

Systematization of roof repair kit

The guide on "Building safe roofs using zinc sheets (CGIs)" has been translated into Spanish, and CRC will use it for future technical training workshops.

Challenges

Delays accumulated with the implementation of the recovery activities of this sector were the main reason for the extension of the operation:

Coordination:

The implementation of activities relied on close coordination between the Cuban Red Cross and Province authorities. The constitution of local groups provided close collaboration and encouraged alignment with authorities' response strategies.

This implementation modality highlighted disparities between Provinces based on the dynamism of local representatives. Some Provinces experienced severe delays due to slowdowns generated by the regional coordination process while others were able to support the timely implementation of activities.

Supply chain:

All material requested for the implementation of the activities, including roofing, had to be sourced abroad and imported to Cuba. Compliance with import processes delayed supplying in the country.

Logistics relied on state-owned companies, which showed difficulties in absorbing an increased activity within their planned work and the necessary compliance with national transport regulations. The process of dispatching goods from port to the province proved to be particularly slow in some cases. This process was further slowed down by the different disasters which impacted the country during the implementation of the operations.

Technical solutions:

Delays in installing the roofs were mainly due to the limited availability of construction material in several targeted areas. The Cuban Red Cross relied on the importation of the required equipment.

The technical solution retained during the design phase of the operation was based on the provision of roofing kits, which did not include the support structure for the roof. This solution assumed that metal or wooden roof support material would be available and locally sourced in the targeted areas and/or provided through the support of the national and local authorities.

The Roofing brigades sometimes reported limited access to equipment and training, e.g., they had no ladders or security measures for installers, despite the Cuban Red Cross having provided protective equipment and training.

Not all housing technicians possessed the same technical capacity, and therefore not all had the appropriate ability to verify and certify the roofs' correct installation. Specific measures had to be implemented to ensure the implementation of a standard certification process in all the communities targeted.

The operation was challenged by the absence of dedicated and permanent technical support to work along with the Cuban Red Cross on solving all the technical aspects of the plan of action, more so in the construction area.

Lessons Learned

The design of activities should consider the difficulties of import procedures and international limitations to best plan for possible delays as the supply chain was the primary source of setbacks for the implementation.

As protection material provided during the operations proved to be limited in number, the implementation of such activities requires a review of the protection kits supplied to the builders to add elements such as harnesses and ladders to support a safe work.

Additional training should also be provided to all technicians to ensure they all handle a standard quality control process.

The implementation of PASSA has been solicited in several communities as a consistent approach for shelter needs in the country. The application of the methodology requires permanent technical support and adequate planning with the Ministry of Constructions. Therefore, this activity will be implemented through the Country Plan.

Water, Sanitation and Hygiene



People reached: 33,795
Male: 16,560
Female: 17,235

WASH Outcome 1: Immediate reduction in risk of waterborne and water related diseases in targeted communities.

Indicators:	Target	Actual
7,000 families received with drinking water that meets established standards and based on operational needs.	7,000	4,612

WASH Output 1.2: Daily access to safe water which meets Sphere standards in terms of quantity and quality is provided to target population

Indicators:	Target	Actual
7,000 families receive drinking water that meets standards	7,000	4,612

WASH Output 1.3: Hygiene promotion activities which meet Sphere standards in terms of the identification and use of hygiene items provided to target population.

Indicators:	Target	Actual
310 volunteers (10 volunteers for each of the 31 municipalities included in the EPoA) participating in hygiene promotion activities	310	430
7,000 heads of household reached with hygiene promotion activities	7,000	6,759

WASH Output 1.4: Hygiene-related goods (NFIs) which meet Sphere standards and training on how to use those goods is provided to the target population.

Indicators:	Target	Actual
3,049 families receive a hygiene kit	3,049	3,049

Narrative description of achievements

Identification of communities for beneficiary selection, in coordination with local authorities

Communities and CRC selected beneficiaries for both the emergency and recovery phases based on the damage assessments, in coordination with governmental social workers. CRC, in coordination with Spanish Red Cross, visited affected areas to identify beneficiaries.

Purchase of materials according to IFRC procedures

CRC purchased NFIs with support from ARO (distribution table available in annex in the 12-month Operation Update).

Distribution of 1,404 buckets and 3,000 jerrycans

The CRC distributed 1,404 buckets (904 procured by the IFRC and 500 by other donors) and 3,000 collapsible jerry cans (2,000 procured by IFRC and 1,000 by other donors).

Distribution of 7,000 250-litre water tanks

A total of 5,000 water tanks arrived in Cuba as part of the operation. 4,500 tanks were distributed to families in six provinces and 500 to the Ministry of Public Health (MINSAP). The tanks delivered to MINSAP were distributed in the province of La Habana in polyclinic facilities, health institutions and family medical clinics.

The following table shows the distribution of tanks, by province:

Province	# of tanks received in province	Families reached	# of tanks delivered
Matanzas	350	462 ¹	350
Villa Clara	700	700	700
Ciego de Avila	700	700	700
Camaguey	900	900	900
Las Tunas	950	950	950
Holguin	900	900	900
MINSAP ²	500	-	500
TOTAL	5,000	4,612³	5,000

The plan of action included the purchase and delivery of 7,000 water tanks, but logistical delays and discussions with other humanitarian actors such as OXFAM and UNICEF, which were also distributing water tanks in the same areas, the operation decided to reduce the number of water tanks to 5,000.

Distribution of Aquatab tablets (40 mg NADCC 67 mg) through the health system

The CRC distributed 160,000 aquatabs to health institutions. The distribution of aquatabs to MINSAP was beneficial, as it allowed the institution to provide drinking water to all patients coming to the affected provinces, where hygiene promotion and drinking water was one of the programme's priorities since the beginning of the operation. For the Cuban government, disease control was a priority throughout the recovery process, and this donation complemented those efforts.

Purchase and distribution of 3,049 hygiene kits

The CRC distributed 3,049 hygiene kits (which met IFRC standards) in all affected provinces. 1,000 were procured by the IFRC, 500 by the Canadian Red Cross and 1,549 by the Spanish Red Cross.

Purchase and distribution of 7,002 long-lasting insecticide-treated bed nets (LLITNs) to the Ministry of Health

CRC delivered 7,002 insecticide-treated mosquito nets to health authorities for distribution to local institutions in order to assist in controlling vector-borne diseases. 2,000 were procured by the IFRC, 1,000 by the Canadian Red Cross and 4,002 by the Spanish Red Cross.

Reproduction and printing of hygiene promotion materials and distribution thereof in communities

The CRC developed and distributed the necessary materials to promote hygiene in communities, together with local authorities. CRC assisted health institutions and collective centres since the beginning of the operation to support awareness in affected communities and public spaces.

Hygiene promotion workshop for volunteers

A total of 162 CRC volunteers participated in province workshops.

Hygiene promotion workshop for communities

A total of 4,168 individuals in seven provinces received hygiene promotion workshops.

Challenges

¹ The number of families reached is higher than the number of tanks because 48 tanks were distributed in a residential building in the community of Martí where 160 families lived.

² Ministry of Public Health (MINSAP for its acronym in Spanish)

³ It is important to mention that 500 tanks were installed in health institutions, that had a continuous number of people reached (higher than expected), according to the rotation of patients.

The supply chain to dispatch equipment in all the Provinces and communities proved to have generated challenges with the timely implementation of the Plan of Action, as stated before.

The hygiene promotion workshops developed, and National and Provincial levels proved to be challenging to implement on some occasions as the local trainers were not always financially and materially supported to roll out the activity in the communities. Although they had a technical background, they would not always have access to the required (printed) sensitization material or aquatabs.

The Cuban Red Cross pointed out that some of the water tanks are being used more as water storage containers than as tanks since families did not have the necessary funds to purchase the materials to install and connect tanks. A recommendation has been made to include this connection equipment along with the distribution of tanks.

Lessons Learned

The Cuban Red Cross suggested that the hygiene promotion workshop should be completed by a stronger solid waste management component to increase the impact of the activities in the communities. Additional sensitization components should be added to the material provided as the communities solicited other resources to complete their activities. Additional equipment to install the water tanks should be provided along with this equipment to ensure proper usage.



Migration

People reached: 213 people

Migration Outcome 1: People living in areas affected by Hurricane Irma are able to inform their families of their whereabouts.

Indicators:	Target	Actual
100 per cent of individuals registered as separated from family have restored contact	N/A	213

Migration Output 1.1: Family links are restored for people separated from their loved ones as a result of the disaster.

Indicators:	Target	Actual
# of messages processed by RFL network	N/A	213

Narrative description of achievements

The CRC processed 213 RFL requests (100% of the total it received). Due to the displacement of families during the evacuation phase and the relocation of families that lost their homes to the protection centres, the CRC's RFL services enabled families to remain in contact with one another while they were in the protection centres. The RFL network was active in 168 municipalities during the peak of the emergency.

Challenges

The Cuban Government has a high-quality citizen management and protection system for when disasters arise. During emergencies or disasters, authorities suggested to people to reallocate to the homes of family members and friends. People who are unable to do so are housed in well-organized temporary shelters.

Lessons Learned

The Cuba Red Cross was supported by International Committee of Red Cross in order to strengthen their human and material capacities to implement RFL activities.

National Society Capacity Building		
Outcome S1.1: National Society capacity building and organizational development objectives are facilitated to ensure that National Societies have the necessary legal, ethical and financial foundations, systems and structures, competences and capacities to plan and perform.		
Indicators:	Target	Actual
Cuban Red Cross has completed Phase 1 of the Organizational Capacity Assessment and Certification (OCAC) process.	1	0
Output S1.1.2: National Society has assessed its capacity at the headquarters and branch level in order to determine aspects to improve.		
Indicators:	Target	Actual
# of people trained in BOCA	1	26
7 branches begin the BOCA process	7	0
Output S1.1.4: National Societies have effective and motivated volunteers who are protected.		
Indicators:	Target	Actual
# of insured volunteers	7,000	7,000
Output S1.1.6: National Societies have the necessary corporate infrastructure and systems in place.		
Indicators:	Target	Actual
10 additions (type of vehicles) to CRC's institutional fleet delivered during the operation.	10	10
Output S1.1.7: National Societies' capacity to support community-based disaster risk reduction, response and preparedness is strengthened.		
Indicators:	Target	Actual
1 completed National Society preparedness plan of action	1	1
20 volunteers receive training from the National Intervention Team (NIT)	20	25
1 updated hurricane response plan	1	1
20 volunteers trained in contingency planning	20	25
20 volunteers trained as auxiliaries and in the International Disaster Response Laws, Rules and Principles (IDRL) programme	20	25
Narrative description of achievements		

Conduct one OCAC and BOCA ToT and seven branch assessments and work plan development processes

A BOCA training of trainers (ToT) workshop was held from 19 to 22 March, facilitated by three external facilitators designated by IFRC and attended by 26 Cuban nationals representing the 15 provinces in the country, certain branches and CRC national headquarters.

The workshop aimed to train CRC facilitators for potential and future assessment of province and municipal branches. A development plan was included in the Country Plan to give continuity to activities initiated during the operation that could not be completed before close-out.

The training workshop was carried out considering five basic parameters:

1. Ability to exist
2. Organizational capacity
3. Infrastructure
4. Finance
5. Relations and mobilization

Based on this activity, a technical committee was formed consisting of ten individuals from national headquarters and certain provinces, as well as three assessment groups (for three areas of the country: west, central and east).

In addition, the BOCA matrix was exhaustively reviewed in order to adapt it to the Cuban context and thus conduct a pilot. The branch and National Society assessment matrix were useful because it constitutes a tool or method that can be used by local actors without having to rely on guidance by IFRC. Therefore, each branch can conduct an internal analysis and establish a plan with measures to improve results by applying the assessment matrix adapted to specialties.

Two branch development sets were provided to the provinces of Pinar del Rio, Matanzas, Cienfuegos, Ciego de Ávila, Camagüey, Las Tunas, Holguín and Santiago de Cuba, and an additional set to national headquarters.

A pilot will first be conducted in three municipalities (one in the western zone, one in the central zone and one in the eastern zone) in order to prepare a schedule for identified activities.

Finally, a plan of action was prepared that includes the following:

1. Activities schedule
2. Selection of technical group
3. Forming of assessment groups, which include the different technical areas of the National Society. Group leaders should be appointed.
4. Adaptation of BOCA matrix to the Cuban context and validation thereof
5. Selection of resource documents for each sector
6. Budget proposals based on identified needs
7. Determining the workshop implementation methodology
8. Selection of areas of work
9. Organizing of pilot in three zones
10. Creation of an assessment environment in branches (press releases, news, bulletins, etc.)

Purchase of protection and visibility materials for volunteers at the province and municipal level.

The shipment of protection and visibility equipment and materials to be distributed to various CRC province and municipal relief groups arrived on 23 May 2019. 180 protection and visibility kits for volunteers were shared with the team involved in the operation. Each kit included: a hard hat with chin strap, one pair of protection goggles, one pair of knee-high boots, one pair of rubber boots, particle protection eyewear, elbow and knee pads, PIXAR 3 portable headlamps, AA batteries, water ponchos, multipurpose blades, canteen, reflective vest, signal whistle, respirator mask, backpack.

In addition, 360 rescue overalls, 30 canvas stretchers, 10 first-aid kits and 100 umbrellas were distributed.

Strengthening of fleet capacity

The CRC procured three motorcycles, three vehicles (4x4) and a 5-ton cargo truck to strengthen the capacity of fleet management to respond to emergencies.

Meeting of Inter-Specialized Disaster Relief Group (GEOS)

The Inter-GEOS meeting took place from 25 June 2018 to 29 June 2018, with the participation of 40 people; the CRC originally planned to have this meeting in August 2018; however, due to August's holiday season, the CRC decided to hold it earlier.

Contingency Planning Workshop

The contingency plan workshop was developed from January 28 to February 2, 2019. It had the participation of 30 volunteers from 16 provinces (Pinar del rio, Artemisa, La Habana, Mayabeque, Matanzas, Cienfuegos, Villa Clara, Sancti Spiritus, Ciego de Avila, Camaguey, Las Tunas, Holguin, Granma, Santiago de Cuba, Guantanamo and Isla de la Juventud).

A member of the FICR-CREPD technically supported the workshop. This workshop was developed in La Habana one the day after the tornado that hit the province of La Habana.

Workshop on auxiliary role and International Disaster Response Law

The workshop, in which government representatives, academia, the Cuban Bar Association and CRC volunteers participated, aimed to enhance the understanding of the Red Cross Movement's regional response system and raise awareness about key benchmarking tools developed by the IFRC to assess legal and policy frameworks in relation to (i) international humanitarian assistance and aid in case of large-scale disaster (IDRL) and DRR, through exposure to the IDRL Guidelines and the Checklist on Law and DRR. The workshop allowed an exchange of experiences by showcasing successful previous and ongoing IDRL and DRR projects in the Americas and their positive influence on disaster responses (e.g., a case study of Ecuador). The workshop sparked the CRC's and other participants' interest in carrying out an IDRL and a DRR legal study, which would be launched at the Cuban Bar Association's annual course on international humanitarian law in June 2019. The workshop also allowed the Disaster Law Programme (DLP) team to provide support to the operations and logistics teams by effectively addressing some pending IDRL-related issues.

National Intervention Team (NIT) Workshop at the national level

This workshop was developed from October 21 to October 29, 2018. It had 32 participants from the CRC (staff and volunteers), the Cuban Civil Defence, the Ministry of Public Health (MINSAP) and the IFRC-CREPD.

The participating provinces were Pinar del Rio, Artemisa, La Habana, Mayabeque, Matanzas, Cienfuegos, Sancti Spiritus, Ciego de Avila, Camaguey, Las Tunas, Holguin, Granma, Santiago de Cuba, Guantanamo and the Island of Youth.

Also, four volunteers involved in the operation participated in the Regional Intervention Team (RIT) course held in December 2018 in Panama. This operation also supported the development of the RIT course by renting chemical baths for the simulation of the basecamp.

Challenges

The Cuban Red Cross has stated additional visibility material and equipment should be provided to all Red Cross volunteers, as more than 10,000 volunteers actively participated in the plan of action.

The specific context of Cuba requires prior adaptation of all core curricula in order to support efficient implementation and appropriation. Fortunately, the existing knowledge of the Cuban context available within the IFRC, and more so at CCST level allowed to provide insight and technical advices in order to support the implementation of the capacity building activities.

Lessons Learned

The Cuban Red Cross demonstrated to be a central emergency response player in the country as they mobilized teams to respond to the aftermath of Irma and several other events that impacted the island during the following year. Responders of the Cuban Red Cross should be supported in terms of material, equipment, and training to fulfil their mandate and missions. The IFRC looks to continue supporting these teams through the Country Plan.

Due to the limited availability of vehicle spare parts locally, Movement partners are to identify means to support the sustainability of the Cuban Red Cross vehicle fleet. The Country Plan will provide support in this sense for the next year.

It is important that donor requirements (in Spanish) are shared with the Cuban Red Cross from the beginning of the operation for the CRC to be better positioned to comply with all requirements.

Given the monitoring tools available in the country and the ease with which products can be traced, the reporting process has been enhanced to provide tracing of recipients of kits through a bar-coding system.

Future operations should contemplate to provided additional amounts of:

- Safety equipment for brigades (ladders, harnesses, ropes, etc.).
- Material to replicate shelter-related and hygiene promotion training.
- Office supplies and computer equipment for branches to enable them to adequately justify the plan of action.
- Visibility clothing for volunteers participating in the plan of action (ponchos, overalls, t-shirts, caps, etc.).

Strengthened coordination mechanisms at the municipal level have been suggested for enhanced response operations. While coordination was identified as a strength, coordination is not equal across municipalities. It is therefore essential for municipal Red Cross General Secretariats to try to strengthen these coordination mechanisms by always creating, at the beginning of the plan of action, a joint work schedule for the main actors involved at the municipal level to present and share implementation plans.

Due to the growing weight of the “private sector” (cuenta-propistas) in Cuba, the Cuban Red Cross plans to develop procurement procedures inspired by those commonly adopted by Red Cross National Societies throughout the Movement.

The International Disaster Law activities were well perceived by the Cuban Red Cross and local stakeholders. Such activities should be further developed and implemented in Cuba in order to strengthen the Cuban legal framework for international and national response to disasters.

International Disaster Response

Outcome S2.1: Effective and coordinated international disaster response is ensured.

Indicators:	Target	Actual
Capacity to increase National Society capacity to support the operation in terms of human and/or financial resources	3	3
2 coordination tools and mechanisms are implemented	2	2

Output S2.1.1: Effective response preparedness and NS surge capacity mechanism is maintained.

Indicators:	Target	Actual
1 RIT member supporting the operation	1	2
16 monitoring visits conducted by CRC	16	12

Narrative description of achievements

Monitoring visits by CRC

CRC conducted periodic follow-up visits to the provinces of Matanzas, Ciego de Ávila, Santa Clara, Camagüey, Holguín and Las Tunas.

The system developed by the government (temporary working groups) required that each province branch submit a weekly progress report, which was to be shared at weekly national-level interim working group meetings in which Cuban Red Cross participates as a guest. Per recommendations made by Shelter RITs after their visit, it was

decided that progress in the field should be monitored weekly (with the government providing fuel for trips) to have more accurate information on development and ensure the quality of roof installation.

The CRC headquarters decided to conduct at least one monitoring visit a month to all provinces for which progress was being requested to make on-site verifications.

Monitoring visits by IFRC

During the emergency phase, ARO's communications coordinator, its regional disaster management coordinator for the Caribbean and Central America and the head of IFRC's country cluster office for the Spanish-speaking Caribbean and Haiti travelled to Cuba to help coordinate actions and provide support to the National Society on its response to the emergency and the development of the EPoA. In addition, ARO's disaster management coordinator and shelter focal point travelled to Cuba in September 2017 to assist with the preparation of the EPoA, and he later returned in October 2017 to review the EPoA with the CRC. In November 2017, the National Society development (NSD) / PMER delegate from the IFRC's country cluster office travelled to La Habana to provide support during the meetings with partners (ECHO and others) and to help with the preparation of operational reports and assist with some administrative procedures.

In July 2018, the country cluster coordinator and the PMER senior officer, visited the island to collect information and to develop donor reports.

Two monitoring visits were conducted since the last report: one by the shelter expert hired by IFRC and the operation's director, and another by the operation PMER regarding process close-out and preparation of the final report.

Four computers were acquired to support the operation (three for the CRC team and one for the Haiti CCST Team).

High-level visit by the IFRC Secretary General and the Regional Director

In February 2018, the IFRC's secretary general, its regional director for the Americas and its country cluster coordinator for the Spanish-speaking Caribbean and Haiti held a high-level visit with the Cuban government.

Challenges

Labour law in Cuba limited possibility to hire additional coordination and technical capacities to extend its ability to handle the implementation of the Plan of Action.

Future operations of this magnitude should look at having a dedicated team in place to support the coordination. Several monitoring visits to the country were carried out for the monitoring of activities from the IFRC.

Lessons Learned

It is recommended to have IFRC staff based in Cuba so that they can provide closer support to the Cuban Red Cross.

The coordination mechanisms at the municipal level should be strengthened, and joint work schedules prepared to support implementation.

Influence others as leading strategic partner

Outcome S3.1: The IFRC secretariat, together with National Societies uses their unique position to influence decisions at local, national and international levels that affect the most vulnerable.

Output S3.1.1: IFRC and NS are visible, trusted and effective advocates on humanitarian issues.

Indicators:	Target	Actual
Communications campaign developed for the operation	1	1

Output S3.1.2: IFRC produces high-quality research and evaluation that informs advocacy, resource mobilization and programming.

Indicators:	Target	Actual
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1 lesson learned workshop	1	1
1 operation evaluation	1	1
1 market advice for Logistics	1	1
Outcome S3.2: The programmatic reach of the National Societies and the IFRC is expanded.		
Indicators:	Target	Actual
1 regional resource mobilization strategy for the operation	1	1
Output S3.2.1: Resource generation and related accountability models are developed and improved.		
Indicators:	Target	Actual
3 donor visits	3	3
<i>Narrative description of achievements</i>		
<p>Communications campaign</p> <p>The IFRC's Regional Communications Unit disseminated information on the progress of the operation through regional social media channels. The appeal was able to provide the NS with photo/video equipment to produce content portraying the actions on the ground.</p> <p>Lessons learned workshop and operation evaluation</p> <p>The lessons learned workshop took place from 27 to 29 May 2019 and was attended by 30 people. Participants included representatives from both CRC and municipal and province governments in the seven targeted provinces; IFRC staff involved in the operation; and one Partner National Society (Canadian Red Cross).</p> <p>On the first day, attendees engaged in a self-assessment of the actors involved in the operation, using a questionnaire to rate the work carried out by CRC and IFRC.</p> <p>Based on these workshops, the consultant hired for the evaluation toured some of the provinces in order to see the work performed and conduct an evaluation of the operation. During this visit, the consultant had the opportunity to interact with various stakeholders such as beneficiaries, government representatives, CRC volunteers and staff, members of roofing brigades, among others. Evaluators prepared an evaluation report based on this visit that will be published soon</p> <p>Donor visits</p> <p>British Red Cross and ECHO, accompanied by Spanish Red Cross, made visits to the field and to monitor the actions being implemented.</p>		
<i>Challenges</i>		
Completion of the operations evaluation process was hampered by a complex visa request process to access the communities. The evaluation had to be postponed two times due to this administrative limitation.		
<i>Lessons Learned</i>		
The response operations of the Cuban Red Cross benefited from a positive donor response, favoured by a strong resource mobilization plan. The Irma response was the larger response operation in the Cuban Red Cross history and demonstrated the capacity of the International Movement of Red Cross to mobilize capacities to the benefit of the Cuban population.		

An effective, credible and accountable IFRC

Outcome S4.1: The IFRC enhances its effectiveness, credibility and accountability

Indicators:	Target	Actual
1 internal audit of the operation completed	1	1

Output S4.1.3: Financial resources are safeguarded; quality financial and administrative support is provided contributing to efficient operations and ensuring effective use of assets; timely quality financial reporting to stakeholders.
<i>Narrative description of achievements</i>
The audit has been completed, and the submission of the report will be made when the Dominica and Antigua and Barbuda operations close as it was a final joint audit.
<i>Challenges</i>
Nothing to report.
<i>Lessons Learned</i>
The management of funds in Cuba requires a specific knowledge of the context by all personnel involved in the process as the country counts with very specific financial rules and limitations.

Continuity of the operation and country plan:

The response operation for Hurricane Irma in Cuba ended on 15 June 2019 with a positive budget balance of 1,290,956 Swiss francs. The evaluation exercise and lessons learned were important for strengthening future interventions and served to inform the process of preparing the Country Plan.

Cuban Red Cross, with support from IFRC, designed a plan of action under the Country Plan, proposing complementary activities to response operations to intensify risk preparedness and mitigation activities as well as contribute to capacity building based on the lessons learned. The country plan has a detailed budget based on the remaining funds from the operation.

The Country Plan designed and approved by Cuban Red Cross includes:

Risk reduction:

- Community risk reduction actions: performance of vulnerability and capacity assessments, awareness-raising at the community level.
- Community actions regarding preparedness for and mitigation of climate change effects based on the Cuban national programme called "Tarea VIDA".
- Capitalization of resilient communities' practices and experiences
- Community-level risk reduction actions will contribute to strengthening communities' capacity to deal with future catastrophic events and to improve.

The activities will be implemented in communities affected by Hurricane Irma. Identification will be carried out in coordination with the civil protection system to contribute to the national disaster preparedness and risk reduction policy.

Shelter:

The Country Plan aims to provide strong continuity to Shelter actions, considering that it was the largest intervention area within the Hurricane Irma response plan of action. Thus, designed actions aim to intensify the actions initiated by the operation and contribute to building capacity in construction practices.

- The PASSA methodology will be implemented in two provinces affected by Hurricane Irma
- The country plan will contribute to disaster risk mitigation actions at the housing level according to actions identified by communities when applying the PASSA methodology
- Five trainings for roofing brigades will be organized in provinces and municipalities where CRC encountered the most significant challenges when implementing actions for the Irma operation.
- Completion of the Safe Roofs course piloted in Cuba and five trainings in the provinces and municipalities where CRC encountered the most significant challenges when implementing actions for the Irma operation.
- Capitalization of post-disaster construction/reconstruction practices within a document, based on experiences gained from hurricanes Sandy and Irma and Ministry of Construction guidelines.

- Cuban Red Cross will explore the possibility of prepositioning humanitarian stocks for 300 families, for future operations.

Strengthening Cuban Red Cross institutional capacity:

The Country Plan aims to contribute to strengthening CRC's institutional capacity, following up on actions initiated within the Irma operation and offering actions in response to the lessons learned from the operation:

- OCAC and BOCA processes undertaken during the Hurricane Irma response operation.
- National-level finance management training to disseminate financial IFRC standards and donor compliance for national operations such as for the response to Hurricane Irma.
- Course on and design of purchasing protocols based on the local context and standards in force at the international level.
- Training for National Society response teams and the purchase of protection and visibility equipment for volunteers. Also, 7,000 CRC volunteers will have insurance by 2020.
- Financial support for CRC vehicle fleet maintenance.

The Country Plan will cover costs associated with coordination, monitoring and technical quality control of activities' implementation.

The Country Plan will be implemented through the Dominican Republic, Haiti and Cuba Cluster Office.

Also, the Disaster and Crisis, Prevention, Response, and Recovery (DCPRR) Department will support the following activities for the **strengthening of the disaster management regional system**:

- Conduct a RIT course
- Strengthening the regional system to respond to the hurricane season 2020
- Conduct a regional meeting to prepare for the 2020 hurricane season
- Conduct a feasibility study for Forecast-Based Financing projects

CONTACT INFORMATION

Reference documents

Click here for:

- [Previous Appeals and updates](#)
- [Revised Emergency Plan of Action \(EPoA\)](#)

For further information, specifically related to this operation please contact:

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How we work

All IFRC assistance seeks to adhere to the **Code of Conduct** for the International Red Cross and Red Crescent Movement and Non-Governmental Organizations (NGO's) in Disaster Relief and the **Humanitarian Charter and Minimum Standards in Humanitarian Response (Sphere)** in delivering assistance to the most vulnerable. The IFRC's vision is to inspire, **encourage, facilitate and promote at all times all forms of humanitarian activities** by National Societies, with a view to **preventing and alleviating human suffering**, and thereby contributing to the maintenance and promotion of human dignity and peace in the world.

The IFRC's work is guided by Strategy 2020 which puts forward three strategic aims:



Save lives.
protect livelihoods,
and strengthen recovery
from disaster and crises.



Enable **healthy**
and **safe** living.



Promote **social inclusion**
and a culture of
non-violence and **peace**.

Emergency Appeal

FINAL FINANCIAL REPORT

Selected Parameters			
Reporting Timeframe	2017/9-2019/10	Operation	MDCRU004
Budget Timeframe	2017/9-2019/6	Budget	APPROVED

Prepared on 05 Dec 2019

All figures are in Swiss Francs (CHF)

MDCRU004 - Cuba - Hurricane Irma

Operating Timeframe: 15 Sep 2017 to 15 Jun 2019; appeal launch date: 15 Sep 2017

I. Emergency Appeal Funding Requirements

Thematic Area Code	Requirements CHF
AOF1 - Disaster risk reduction	16,125
AOF2 - Shelter	8,163,846
AOF3 - Livelihoods and basic needs	0
AOF4 - Health	0
AOF5 - Water, sanitation and hygiene	451,314
AOF6 - Protection, Gender & Inclusion	0
AOF7 - Migration	6,922
SFI1 - Strengthen National Societies	532,506
SFI2 - Effective international disaster management	332,965
SFI3 - Influence others as leading strategic partners	57,510
SFI4 - Ensure a strong IFRC	27,777
Total Funding Requirements	9,588,965
Donor Response* as per 05 Dec 2019	9,302,219
Appeal Coverage	97.01%

II. IFRC Operating Budget Implementation

Thematic Area Code	Budget	Expenditure	Variance
AOF1 - Disaster risk reduction	16,125	221	15,904
AOF2 - Shelter	5,349,671	5,742,984	-393,313
AOF3 - Livelihoods and basic needs	0	0	0
AOF4 - Health	2,558	2,558	0
AOF5 - Water, sanitation and hygiene	250,100	268,627	-18,527
AOF6 - Protection, Gender & Inclusion	0	0	0
AOF7 - Migration	0	0	0
SFI1 - Strengthen National Societies	859,203	454,456	404,746
SFI2 - Effective international disaster management	2,097,772	1,529,750	568,021
SFI3 - Influence others as leading strategic partners	133,593	26,933	106,660
SFI4 - Ensure a strong IFRC	18,265	327	17,938
Grand Total	8,727,287	8,025,857	701,430

III. Operating Movement & Closing Balance per 2019/10

Opening Balance	0
Income (includes outstanding DREF Loan per IV.)	9,316,583
Expenditure	-8,025,857
Closing Balance	1,290,727
Deferred Income	229
Funds Available	1,290,956

IV. DREF Loan

* not included in Donor Response	Loan :	453,459	Reimbursed :	453,459	Outstanding :	0
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Emergency Appeal

FINAL FINANCIAL REPORT

Selected Parameters			
Reporting Timeframe	2017/9-2019/10	Operation	MDCRU004
Budget Timeframe	2017/9-2019/6	Budget	APPROVED

Prepared on 05 Dec 2019

All figures are in Swiss Francs (CHF)

MDCRU004 - Cuba - Hurricane Irma

Operating Timeframe: 15 Sep 2017 to 15 Jun 2019; appeal launch date: 15 Sep 2017

V. Contributions by Donor and Other Income

Opening Balance							0
Income Type	Cash	InKind Goods	InKind Personnel	Other Income	TOTAL	Deferred Income	
American Red Cross	498,778				498,778		
Andorran Red Cross	4,704				4,704		
Australian Government	29,733				29,733		
Belgian Federal Government	450,756				450,756	229	
British Red Cross (from British Government*)	2,294,972				2,294,972		
China Red Cross, Hong Kong branch	23,485				23,485		
Cyprus Red Cross	5,988				5,988		
Czech Government	98,034				98,034		
Danish Red Cross (from Denmark - Private Donors*)	701				701		
DELTA AIR LINES INC	30,843				30,843		
ELMA Relief Foundation	500,000				500,000		
Estonia Government	28,622				28,622		
European Commission - DG ECHO	1,611,814				1,611,814		
Fondation Trafigura	0				0		
IFRC at the UN Inc	2,594				2,594		
Japanese Red Cross Society	87,968				87,968		
Mondelez International Foundation	15,422				15,422		
Norwegian Red Cross (from Norwegian Government*)	580,788				580,788		
Other	49,000				49,000		
Pfizer Inc	30,843				30,843		
Red Cross of Monaco	36,202				36,202		
Republic of Korea Government	299,149				299,149		
Swiss Government	500,000				500,000		
The Canadian Red Cross Society	817,733				817,733		
The Canadian Red Cross Society (from Canadian Gov	154,324				154,324		
The Netherlands Red Cross	588,237	81,498			669,735		
The Netherlands Red Cross (from Netherlands Govern	437,763				437,763		
Tonga Red Cross Society	5,692				5,692		
Ultimate Software Group	50,942				50,942		
Total Contributions and Other Income	9,235,085	81,498	0	0	9,316,583	229	
Total Income and Deferred Income					9,316,583	229	

Annex 1

ANCLAJES ANTIHURACANES



Los anclajes se usan para fortalecer las uniones entre:

- Los listones y las vigas, puesto que necesitan resistir fuerzas verticales (tracción)
- Las vigas y el travesaño superior, puesto que necesitan resistir fuerzas verticales y horizontales (tracción y corte)
- Los anclajes antihuracanes están fabricados en acero galvanizado en caliente o en acero inoxidable. El recubrimiento de zinc usado varía normalmente entre 350 y 450 g/m²

Correa antihuracanes (bobina o rollo)



Elementos de fijación para anclajes y correas antihuracanes

TIPO DE FIJACIÓN

Clavos 304 x 3.18" (7.6 x 80 mm)	
Clavos 304 efecto cónico 3.18" (7.6 x 80 mm)	
alfileres 304 x 3.18" (7.6 x 80 mm)	
Clavos 304 x 3.18 mm	
Tornillos para madera autoataornillados (3.18 x 38 mm)	

Pasos para el montaje

Por cada lámina se colocan 24 clavos con arandelas.

Los clavos se colocan en las alfagias.

Los clavos van colocados en la parte superior de la ondulación de la lámina.

Se coloca el caballete con lámina de zinc

Se debe doblar en la misma dirección que la ondulación del techo



Federación Internacional de Sociedades de la Cruz Roja y de la Media Luna Roja

TALLER TECHOS SEGUROS

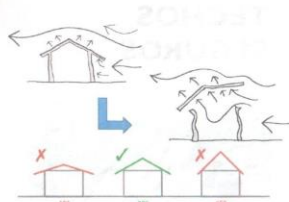


REMEDIOS
7 DE MAYO 2018

Estructura de techos

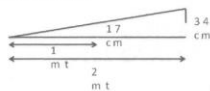


VIENTOS



Para reducir los efectos de succión y desprendimiento cuando hay fuertes vientos, todo de construir su techo con un mínimo de 30 grados de inclinación y un mínimo de 40 grados.

Por cada metro (Horizontal) se sube 17 cms



Pasos para el montaje

Se colocan los largueros

Se colocan las llaves y travesaños.

Se colocan los pies de amigo.

Se coloca la cumbrela

Se colocan las ALFARDAS

—La primer Alfarda y la última.

—Con un naylon hacemos nivel de la primera a la última.

—Se marca el Larguero a cada 60 cm.

Se dejan de 20 cms a 30 cms en la ALFARDA para el ALERO.

Se colocan las Cintas Antihuracanes.

En todas las uniones de la alfardas al larguero.

Columna u Horcon-Larguero

Alfarda-Larguero

Parales-Larguero



Se inicia con el montaje de láminas de zinc

1.Ver la dirección del viento predominante. Observar el follaje de los arboles

2.Consultar la memoria historica de los vientos más fuertes.

—Comenzar el montaje en dirección opuesta al viento predominante.

—La lámina debe sobre salir 5 cms desde la tab-

—Se debe de sobreponer la lámina por dos ondulaciones de la misma.

Cómo construir techos seguros con chapas onduladas de hierro galvanizado



International Federation of Red Cross and Red Crescent Societies
Shelter Research Unit

Annex 2

ESPECIFICACIONES TÉCNICAS PARA LA APROBACIÓN DE TECHOS INSTALADOS

1. Asegurarse de que la estructura del techo este instalada con madera de buena calidad

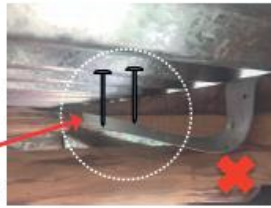
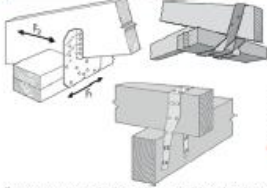
- Evitar utilizar la siguiente madera:
- Madera apollada
 - Madera vieja
 - Madera muy delgada
 - Intentar que la madera sea uniforme
 - Madera humada



2. Correcta instalación de la estructura de madera

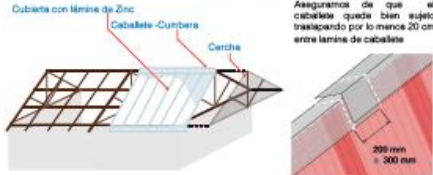


3. Instalación de la cinta anti- huracán en la estructura del techo



Tomar en cuenta que la cinta anti huracan debe sujetar la estructura del techo con la estructura principal de la vivienda

4. Todo techo debe tener un caballete / cumbrera



El caballete puede ser realizado del mismo material de las láminas de zinc cortado y doblado para que se ajuste a las medidas necesarias

5. Lámina de zinc



6. Instalación de clavos tipo paraguas



Todos los clavos deben estar ligeramente doblados en la parte inferior

1. Clavo no ha ingresado completamente por falta de presión
2. No clavar con mucha presión para evitar que se rompa la goma
3. Nivel de presión al clavar adecuado

Para doblar los clavos se puede usar un alicate o un fierro para no dañar la madera o sacar el clavo por la presión

7. Instalación de clavos en lamina de zinc



RECOMENDACIONES

Al momento de realizar la medición para la distribución de láminas tomar en cuenta la instalación de aleros para la vivienda

Al hacer reparaciones sobre techos ya existentes hay que asegurarse de que las láminas nuevas tengan las mismas dimensiones de ondas que las láminas instaladas previamente en el techo; de lo contrario, no se superpondrán de manera adecuada y puede haber filtraciones en el techo.

Utilizar todos los materiales del kit de techo:

1. Láminas de zinc
2. Cinta Anti - Huracán
3. Clavo para madera (75x 3.6mm - diámetro de la cabeza 7.7mm)
4. Clavo de madera para sujetar la cinta (40x 3.6mm - diámetro de la cabeza 7.7mm)
5. Clavo de caña helicoidal con cabeza tipo sombrilla y alfileres (para sujetar las láminas de zinc a la estructura de madera del techo)

Sugerir al beneficiario instalar una cancheta para el desagüe de agua en concreto hacia un lugar específico (Ver Figura 7)



Figure 7