EUROPEAN COMMISSION

DIRECTORATE-GENERAL FOR HUMANITARIAN AID AND CIVIL PROTECTION - ECHO

**SINGLE FORM FOR HUMANITARIAN AID ACTIONS : Final Report**

# 1. GENERAL INFORMATION

### 1.1 Name of Humanitarian Organisation / Country of registration

UNDP-USA

### 1.2 Title of the Action*

Enhancement of the hydro meteorological Early Warning System (EWS) in order to increase the disaster preparedness and reduce the vulnerability of the populations living in the provinces most affected by hurricane Sandy

### 1.3 Area of intervention*

| World area : | Country : | Region : |
|---|---|---|
| America | Cuba | East |

### 1.4 Start date of the Action

**Start date :** 15/06/2013

**If the Action has already started explain the reason that justifies this situation (urgent Action or other reason)**

### 1.5 Duration of the Action in months *

| | |
|---|---|
| **Months*** | 18 |
| **Days*** | 17 |

### 1.6 Start date for eligibility of expenditure

**Is the start date for eligibility of expenditure equal to the date of submission of the initial proposal ?***

no

**Explain expenses charged to the budget between date of submission of the initial proposal and start date of the action**

N/A

**If no, enter the start date for eligibility and explain above**

15/06/2013

### 1.7 Requested funding modalities for this agreement

**Requested funding***

Multi-donor action

**In case of 100% financing, justify the request**

**Action total amount ( copied from 11. Financial overview) :** 673.518,00 Eur

**DG ECHO contribution requested ( copied from 11. Financial overview) :** 572.000,00 Eur

### 1.8 Urgent action

**Is urgent?***

no

### 1.9 Control mechanism to be applied

P

### 1.10 Proposal and reports

| | |
|---|---|
| **Submission date of the initial request** | 31/01/2013 |
| **Purpose of this submission** | Final report |
| **Echo reference** | 2013/00296/FR/01/01 |
| **Agreement number** | |
| **Date of submission** | 01/04/2015 |

### 1.11 [INT] List the supplementary agreements and exchange of letters after signature of the Agreement up to intermediate report stage

| Date of request | Date of agreement | Subject | Reference |
|---|---|---|---|

### 1.12 [FIN] List the supplementary agreements and exchange of letters after signature of the Agreement up to final report stage

| Date of request | Date of agreement | Subject | Reference |
|---|---|---|---|
| 05/11/2014 | 17/11/2014 | Agreement ECHO/DIP/BUD/2013/94014 Amendment n0 1 - Amendment by mutual consent | Ref. Ares (2014)3815239 - 17/11/2014 |

## 2. NEEDS ASSESSMENT

### 2.1 Date(s) of assessment; methodology and sources of information used; organisation/person(s) responsible for the assessment

Hurricane Sandy hit Cuba on October 25th, 2012 and crossed the eastern region as a category 2 hurricane (approaching category 3) in a five-hour span. Sustained winds reached 200 km/h as Sandy lashed Santiago de Cuba and Holguín, Cuba's second and third most densely populated provinces, affecting the 78% of their population.
The institutions in charge of assessing the damages and the needs of the population affected by Hurricane Sandy are The National Office of Statistics and Information (ONEI) and the Ministry of Foreign Trade and Investment (MINCEX) of the Government of Cuba. Immediately after the passage of the hurricane, these institutions started to carry out general assessments throughout the affected region, in co-ordination with local authorities and the ministries of Health (MINSAP), Construction (MICONS) and Education (MINED). These institutions undertook house-by-house assessments in various areas, including the municipality targeted by this proposal. The damage assessment of the hydro-meteorological EWS was led by the Institute of Meteorology (INSMET) and the Institute of Hydraulic Resources (INRH).

### 2.2 Problem statement and stakeholder analysis

The infrastructure of the hydro-meteorological EWS was severely damaged, including the power supply, monitoring and communication systems and facilities, mainly in Santiago de Cuba and Holguín.
As a result of the impact of the hurricane, the hydro-meteorological monitoring system in the eastern region is not as reliable as it should be, as it depends mostly on over 20 years. During hurricane Sandy, and due to the strong winds, many instruments, particularly those installed outside the buildings, suffered damages.
The hydro-meteorological EWS communication system of the eastern provinces depend on the National Telecommunication Service Provider (ETECSA), which uses highly vulnerable aerial telephone lines for voice and data services. During hurricane Sandy, the telephone line of the Provincial Meteorological Center (PMC) of Santiago de Cuba shut down losing the communication as well as those of all the WS which are routed through a server at the PMC office. To deal with this contingency, the PMC of Granma, which had been recently upgraded under a UNDP-DIPECHO project, played a very important role by receiving the information to and from the WS of Santiago de Cuba and the WS in the region.
This experience showed the importance of maintaining the uninterrupted operation of the communication network at Risk Reduction Management Centers (RRMC) and Early Warning Points (EWP) in vulnerable communities in Santiago de Cuba and Holguín (equipped under UNDP projects). While some of them were able to convey the information generated by WS in isolated areas, there isn't a reliable communication link with their corresponding PMCs or appropriate communication protocols to share the data.
The damage caused jeopardizes the operational capacity of the regional hydro-meteorological EWS and put around one million people in Santiago de Cuba, one million in Holguín, half a million in Las Tunas and another half a million in Granma under very vulnerable conditions. This includes families who will be living in temporary facilities in the next hurricane season or who will have their house roofs covered only with provisional materials such as tarpaulin and metal sheets. They are classified vulnerable according to the Hazard, Vulnerability and Risk Studies (HVRS).
Although other regions were not as severely affected by hurricane Sandy as the Santiago de Cuba's city, their hydro-meteorological EWS need to be strengthened because they share the same physical-geographical zone and their data is necessary for the forecasting and the early warnings generation in the overall eastern region.
From this analysis it is clear the need to strengthen and make more reliable the systems of monitoring and communications of the hydro-meteorological EWS and to facilitate the timely exchange of information between the stakeholders identified, including the more vulnerable groups of the population in the targeted provinces.

### 2.3 Summarise findings of the assessment (include full report in annex, if relevant) and link these to the Action

An estimated 1.3 million people were directly affected by hurricane Sandy as a result of the damage to housing, the impact on access to safe water, the food losses, and the disruption to health services and education. Santiago de Cuba and Holguín (the second and third largest cities in the country) are now in a recovery phase. By the time the next hurricane season begins, there will be a significant number of affected people still recovering. It is therefore important to guarantee a monitoring system and a hydro-meteorological EWS that can reduce risks to these families.

Sandy hit the hydro-meteorological EWS monitoring and communication infrastructure in the eastern provinces of the country, thereby jeopardizing its operational capacity and uninterrupted work. Nine WSs were affected in Santiago de Cuba and Holguín. The main damage involved measuring instruments and aerial data-transmission lines, as well as computing equipment.

Hydro-meteorological EWS communications rely on supports of ETECSA, which uses aerial telephone lines for voice and data services. These lines are highly vulnerable to extreme weather events (strong winds and heavy rains). The PMC telephone line in Santiago de Cuba was broken so all the data transmission between its stations (routed through a server at the Center) were also interrupted.

The proposed solution is to upgrade the monitoring and communication systems of the EWS to ensure improved measurements, a higher level of reliability and effectiveness in the processing and transmission of information. Furthermore, it is envisaged to establish a platform for the exchange of information, the processing of data and the generation of services to help in decision-making and in the communication of weather forecasts and hydro-meteorological warnings to stakeholders and the population.

An appropriate EWS design should take into account the information and analysis of the HVRS, which include hazards such as floods due to heavy rains, sea level rise, strong winds, etc., and make it possible to develop forecasts, scenarios and simulations, based on different vulnerabilities.

See Annexes 2 and 3.

*** The tables ( if necessary ) must be annexed.**

**Tables with additional information**

**2.4 [INT] If changes in needs assessment at intermediate report stage, please explain**

No changes

**2.5 [FIN] If changes in needs assessment after intermediate report, please explain**

No changes

## 3. HUMANITARIAN ORGANISATION IN THE AREA OF INTERVENTION

**3.1 Humanitarian Organisation's presence in the area of intervention**

**brief overview of strategy and current or recent activities in the country**

With a presence in Cuba dating back to 1975, UNDP has traditionally supported the efforts of the Government to mitigate the impact of disasters, including hurricanes. Within the context of disaster preparedness, UNDP has been particularly relevant, accumulating work experience in disaster risk reduction, in co-ordination with the Civil Defense and other key stakeholders such as local governments. UNDP has implemented Disaster Risk Reduction (DRR) projects in six provinces, helping establish a network of 63 municipal and provincial RRMCs, including the preparation of risk reduction plans and studies. UNDP has also contributed to strengthening meteorological, hydrological, seismological, fire and health hazard EWS.

UNDP has a partnership with the INSMET, the INRH and the National Environment Agency (AMA). At local level, the PMC of INSMET collects and manages information from the WS in each province, and prepares local forecasts, reports and warning messages. On the other hand, INRH has provincial divisions, Basin Control Centers, and a network of WS and Volunteers. INSMET and INRH have equally signed a partnership agreement to share information. Also at the local level, UNDP has been working with the Representation Offices of the AMA, RRMC under the umbrella of local governments. UNDP, in coordination with local governments, is responsible for ensuring the systematic monitoring of activities and actions designed to achieve expected results.

The project will be executed by UNDP under the modality of direct implementation, in close coordination with MINCEX, which is the national institution responsible for International Cooperation in Cuba. UNDP is leading the Shelter and Non-Food Items sector group, where the recovery and upgrading of the Meteorological EWS was identified as a priority in order to ensure that individuals and institutions are prepared in the eventuality of a natural disaster. Under this type of implementation, UNDP will provide all technical and operational capabilities, and will be responsible for the purchase of supplies and equipment using UNDP's "fast-track" procedures following the authorization given by UNDP's headquarters. The UNDP Cuba Operations Unit will play a key role, particularly the Procurement Division, which will ensure the provision of the inputs identified at this initial stage of the emergency in a timely fashion and with the quality of response required.

UNDP has also established close working coordination with the local governments through the focal points designated in each province. UNDP has gained work experience in the three provinces where it has environmental management, local development and enhanced risk reduction projects. The latter includes the supply of equipment for the network of RRMCs in Santiago de Cuba and the completion of the network of such centers in Holguín, after having strengthened their EWSs.

**3.2 Actions currently on-going and funding requests submitted to other donors (including other EC services) in the same area of intervention - indicate how overlap and double funding would be avoided**

The UN system, led by the UN Resident Coordinator, is working in close coordination with the MINCEX to officially address the

The UN system, led by the UN Resident Coordinator, is working in close coordination with the MINCEX to officially address the emergency. This dialogue and response follow previously agreed mechanisms. OCHA staff were deployed immediately after hurricane Sandy hit the country to support Cuba and UN System response efforts.
The UN Disaster Management Team (UNDMT) agreed to support the country under the CERF mechanism. The UN Technical Team (UNETE), led by pre-established agency leaders, is working with the technical staff of government counterpart agencies. Inter-sector discussions were also carried out with the objective of maximizing the impact of planned interventions. UNDP is leading the shelter and NFI sector, and UNICEF is leading the WASH and Hygiene sector.
To immediately support the Government, UN partners (OCHA, UNDP, UNFPA, UNICEF) allocated emergency stocks, including 80MTs of NFIs (hygiene kits, kitchen sets, tarpaulins, school kits and water tanks), sent from Panama to Santiago de Cuba on 8 and 10 November 2012.
In coordination with the Government, a CERF allocation of 5,5 million USD was approved for the most urgent needs in five priority sectors: agriculture and food, emergency shelter and NFI, WASH health and education in emergencies, with the city of Santiago de Cuba.
Along with other sources of funding that were sought by UN System in Cuba, the CERF rapid response grant represented an essential and timely contribution to alleviating the severe humanitarian impact of the disaster. It allowed to support the humanitarian efforts of the Cuban authorities to address the immediate needs generated by this unusually destructive hurricane and prevent the further rapid deterioration of conditions in all the above mentioned sectors.
UNDP has also provided regular resources to respond to the emergency, with the acquisition of NFI. These funds were used to purchase basic means to meet the needs of affected populations. These resources have already been acquired and distributed to beneficiaries. UNDP and UNICEF CERF funded projects are already being implemented, and procurement processes are advanced. Basic goods are expected to arrive and be distributed in the country in the short term.
All the activities in support of the emergency situation are being implemented under the fast-track mode, for which the UNDP and UNICEF have strengthened capacities.
A 28 million USD Action Plan for Cuba was launched in order to complement the response and facilitate early recovery. UN system in Cuba led by the pre-established agency leaders, held discussions with international NGO and the Red Cross to avoid duplication of efforts in the development of this plan.
INSMET will take advantage of 11 Automatic Weather Stations (AWS) supplied under a Chinese grant, which fails to cover all the technical specifications needed, and will install them with upgraded processing and communication systems acquired under this project.

### 3.3 [FIN] List other actions carried out by the humanitarian organisation or its implementing partners in the same period in that area of intervention and how risks for double funding were avoided

Over the implementation period of the present action, UNDP has developed other actions in the province of Santiago de Cuba, focusing on resilient recovery of living conditions and strengthening of local production of building materials. All these initiatives are in line with UNDP commitment to mobilize funds within the framework of the Action Plan, after the impact of hurricane Sandy:

1. Supporting resilient recovery in the city of Santiago de Cuba after the impact of hurricane Sandy, using regular UNDP funds.

2. Supporting basic living conditions in the territories affected by hurricane Sandy in Santiago de Cuba, with funding fromthe Kingdom of Norway, through UNOCHA.

3. Supporting housing recovery in a resilientand sustainable manner in the province of Santiago de Cuba afterthe impact of hurricane Sandy, with funds from the Government ofRussia.

The implementation of these actions does not imply duplication of resources. More than two years after Hurricane Sandy, the province of Santiago de Cuba, continues with the recovery plans headed by local authorities. The UNDP maintains its commitment to support the recovery and development of the territory

## 4. OPERATIONAL FRAMEWORK

### 4.1 Exact location of the Action (include map of action location)

| world area | country | region | location* |
|---|---|---|---|
| America | Cuba | East | Santiago de Cuba, Holguín, and other areas with coverage of EWS |

### Map of action location (reference)

Annex.1

### 4.2 Beneficiaries

#### 4.2.1 Total number of direct beneficiaries

**Total number** 150.400
**Total number [INT]** 150.400
**Total number [FIN]** 150.400

**Comments**

The project will benefit 150,400 individuals covered by 156 Early Warning Points (EWP) installed in vulnerable communities of the east, in a network with 44 municipal and provincial RRMC. This number represents 30% of the total population (539,522) in vulnerable areas according to Hazard, Vulnerability and Risk Studies (HVRS). Also around 400 workers, including technicians, specialists, voluntary observers and decision-makers, will benefit from the introduction of new technologies.

**Tables with additional information**

| Province | Area ($km^2$) | Municipality | Settlements | Total Population of Provinces | Vulnerable Population according to HVRS | Vulnerable Population Directly Benefited according to EWP |
|---|---|---|---|---|---|---|
| Santiago de Cuba | 6.156 | 9 | 623 | 1.047.000 | 257.748 | 40.000 |
| Holguín | 9.293 | 14 | 1.112 | 1.300.000 | 111.673 | 50.000 |
| Other territories at eastern | 14.963 | 21 | 1.351 | 1.371.000 | 170.101 | 60.000 |
| **Total** | **30.412** | **44** | **3.086** | **3.718.000** | **539.522 (16% of total population)** | **150.000 (30% of vulnerable population)** |

### 4.2.2 Status of the direct beneficiaries* (multiple options possible)

- ☐ IDPs
- ☐ Refugees
- ☐ Returnees
- ■ Local population
- ■ Others e.g. for Grant Facility, Capacity building, etc.

### 4.2.3 Specificities of direct beneficiaries (please elaborate according to SF guidelines)

Of the vulnerable population, about 27,000 (18%) are elderly people and 28,500 (19%) are below 15 years old. Of the specialists and decision-makers, about 140 (35%) are women.

### 4.2.4 Direct beneficiary identification mechanisms and criteria

The population selected as direct beneficiaries (150.000) represents 30% of the total population (539.522) living in vulnerable areas in the eastern provinces, according to HVRS diagnosis. They were selected because they are covered by the 156 EWPs linked to 44 RRMCs at local and provincial level. They are therefore those who would benefit from timely alerts and warnings, and the right community response.
The other direct beneficiaries (400) are the specialists and decision-makers involved in the operation of hydro-meteorological EWS, who will benefit from the introduction of new technologies and capacity buildings.

### 4.2.5 Describe to what extent and how the direct beneficiaries were involved in the design of the Action

The most vulnerable areas and the number of beneficiaries have been identified through joint studies made by specialists from INSMET, INRH, AMA and CD (Civil Defense), in coordination with the local governments and the RRMCs of the targeted provinces. Based on these studies, the roles of each actor and the importance of inter-agency collaboration were also determined.
A special role was played by local multidisciplinary teams responsible for updating the HVRS, in coordination with community representatives and the vulnerable population.

### 4.2.6 Other potential beneficiaries (indirect, "catchment", etc.)

**Number of other potential beneficiaries** 389.572

**Comment**

The population selected as indirect beneficiaries (389.522) are 70% of the total vulnerable people (539.522) in the eastern provinces. This people will benefit from the improved EWS services beacuse Cubans are well aware of how the warnings are disseminated and most families have a radio or TV set at home.
Others indirect beneficiaries are the 20 foreign experts and 30 AMA representatives who will attend workshops and other capacity building activities under this Action.

### 4.2.7 Direct beneficiaries per sector *

### Comments

**Local Disaster Management Components:** 618 people
EWP, AWS, AHS, PHRC, PMC,RRMC and government

**Institutional linkages and advocacy:** 170 people
INSMET,INRH, CD and government

**Information, Education, Communication:** 150.400 people
Population, RRMC, EWP, AWS, AHS, INRH, INSMET, CD and government

| Sector name | Number of beneficiaries per sector | | |
|---|---|---|---|
| | Target | [INT] | [FIN] |
| Disaster Risk Reduction / Disaster Preparedness | 151.188 | 151.188 | 151.188 |

### 4.2.8 [INT] In case of changes, please explain

3 satellite receiving stations for the INSMET were acquired, which have been installed by the specialists of this institution. After installing the system, specialists were trained in situ in its functioning, during the setting up and the operation testing by the expert of DARTCOM Company. These stations are already functioning providing images which will be used in the preparation of forecasts, climatological studies of drought and monitoring of extreme local events. Annex 1. In this institution, a Davis model Synoptic Weather Station was also implemented, which will be installed in the EWP in the selected provinces. This station is piloting the effect of other 12 stations that will be transferred to the territories with the appropriate applications for its use. It is in its testing phase to check temperature data, relative humidity, wind speed and direction, atmospheric pressure, rainfall, dew point, among other parameters, which have been successfully received. Other advances have been the homologation of RLAN equipments and the formalities to obtain the permission from the Ministry of Communications for wireless communication field testing. Another significant aspect to highlight is the numerical modeling, which is the basis for making the weather forecast. For the first time in Cuba, information from radar and satellite is being simultaneously assimilated, which directly influences in the quality and accuracy of the forecast. Annex 2. A mobile workshop, to facilitate the access to places which were previously almost impossible to reach due to the terrain characteristics, and a set of tools that will allow the installation of automatic weather stations in the selected provinces, were acquired.A first version of the presentation software for weather on the TV is currently being set-up. Annex 3.The INSMET has had a change of its Director-General, which has been incorporated after the approval and implementation of the project. His attitude has been positive towards the execution of this initiative, counting with his support andhis strong working knowledge of the functioning of the provinces, as he has held executive roles at the Ministry of Science Technology and Environment (CITMA). INSMET specialized centers have been strengthened because the importance of the integration of the numerical modeling outputs,the weather variables measurements, the climatological studies and the weather forecasting reports. The drought forecasting reports have also been included to the projectdata management because the importance of this hydrometeorological event to the EWS identified on HVRS and a workshop developed by AMA. In this workshop the UNDP National Risk Office was invited. Close relations between the working groups of different institutions involved in the project have been maintained, specifically between INSMET and INRH, taking into account that the acquisition of the hydrological stations was delayed due to the economic embargo the United States government applies to Cuba. This situation has led to the identification of new suppliers to acquire these stations, complying with the technical requirements. Several articles on the EWS and reducing risks have been published in the Cuba's Civil Defense Magazine. Annex 4. The project and the results obtained so far will be presented on the platform of the UNISDR. This event will be held in Quito, Ecuador, May 27 to 29 2014, the project results will be displayed in relation to the system of meteorological and hydrological monitoring by building a network of stations that detect and process the data necessary to ensureconstant monitoring of hydrometeorological events and the importance in assessing HVRS to facilitate decision-making by local authorities.

### 4.2.9 [FIN] In case of changes, please explain

The 4 Early Warning System (EWS) components were strengthened, guaranteeing the availability of information to all

The 4 Early Warning System (EWS) components were strengthened, guaranteeing the availability of information to all EWS-related actors for the protection of people and property

In connection with surveillance, three satellite stations were established at the Institute of Meteorology (INSMET) for the national meteorological service. Also the specialists of INSMET designed and implemented integration software of meteorological and satellite-based information services to cover the National Meteorological Service. Additional software licences were also procured for data processing at PMCs (Annex 2). Portable meteorological stations were established at 12 EWPs and other one was installed in the INSMET (Annex 3). Transmission and processing systems were automated at 15 meteorological stations under the umbrella of the National Network of Meteorological Service Stations. A Mobile laboratory was procured. It includes a set of specialized tools (Annex 4). A total of 10 automatic telemetric stations are currently under operation for measurement and transmission of data about precipitation and water level at surface currents and dams in real time to the National Institute of Hydraulic Resources (INRH) surveillance and monitoring network.A short-term forecast system was put in place to connect numerical weather forecast models (Annex 6). Automated hydrological and hydraulic modelling was also developed to forecast floods in real time over tropical cyclones and heavy rains (Annex 7). Was developed a software application for homologation of different technologies of meteorological station (Annex 8) In connection with risk perception and decision-making, a comprehensive operational procedure was developed to establish joint actions, roles and responsibilities of all EWS-related entities in each of its phases (Annex 5). Also the Comprehensive Operational Platform for Information Management (Annex 9) is the data transmission systems cover the use of strengthened means of communication at meteorological stations using RLAN connections, optical fibre, VHF, and GPRS. The specialized product presentation systems are related to the mapping of hydrological, meteorological and risk-management information, and decision-making.

In connection with warning, the communications system has been enhanced through the installation and operation of new means of communication and the improvement of those working at present. Cordless equipment was installed to ensure EWS information flows at the national and provincial levels. Other pieces of cordless equipment included VHF units at the hydro-meteorological network and GPRS modems at the 15 stations that were strengthened. Optical fibre guarantees transmission over extreme events. In connection with public warning examples are METTV 3 (Annex 10) for weather forecast presentation on television.In connection with protection, community workshops/urban consultations were held on a local scale, seeking to assess and enhance risk perception and preparedness of the population and the institutions for extreme hydro-meteorological events (Annex 12).Another communication product involves an educational spot designed to increase risk perception in the population, including life-saving actions (Annex24: https://www.dropbox.com/s/8x0q1he33rjvipx/spot.f4v?dl=0)
Knowledge management was another priority element of the project. Example of this was the strengthening of Territorial Center AMA with the important role in the training (Annex 13)The project's impact on people that working in the institutions related directly to the EWS system was evidenced in Life Stories of various actors (Annex 14 and 14-1)

#### 4.2.10 [FIN] Estimate per type of beneficiaries (in %)

| | |
|---|---|
| **Women** | 53 |
| **Men** | 47 |
| **Infants less than 5** | 4 |
| **Children less than 18** | 11 |
| **Elderly more than 50** | 43 |

4. OPERATIONAL FRAMEWORK

4.3.1 OPERATIONAL OVERVIEW OF THE ACTION : Logical framework

**Title of the Action :** Enhancement of the hydro meteorological Early Warning System (EWS) in order to increase the disaster preparedness and reduce the vulnerability of the populations living in the provinces most affected by hurricane Sandy

**Principal objective :** To enhance the hydro-meteorological Early Warning System (EWS) in order to increase the disaster preparedness and reduce the vulnerability of those leaving in the provinces most affected by hurricane Sandy.

| Intervention logic | Objectively verifiable indicators | Sources of verification |
|---|---|---|
| **Specific objective**<br>To strengthen the vulnerable components of the EWS, as detected during the passage of hurricane Sandy, and in so doing reduce disaster risks. | **Indicator (1)**<br>Coverage of secure communication links at local and national level<br>**target value :** At least 47 % of the secure links | **Sources of verification (1)**<br>-Equipment procurement<br>-Field visits<br>-Network traffic reports<br>-Photos of the installed links |
| | **Indicator (2)**<br>Risk prediction procedure improved and properly disseminated (improvement of the communication equipment)<br>**target value :** At least 2 warnings | **Sources of verification (2)**<br>-Prediction effectiveness<br>-Users feedback<br>-Field visits<br>-Interviews |
| | **Indicator (3)**<br>Level of preparedness of stakeholders<br>**target value :** 396 stakeholders | **Sources of verification (3)**<br>-Field visits<br>-Reports<br>-Photos<br>-Interviews<br>-Training lists<br>-Certificates |
| | **Indicator (4)**<br>Local television broadcasting stations are provided with the software required to report the weather<br>**target value :** At least 4 television stations | **Sources of verification (4)**<br>-Television images and videos of weather forecasting<br>-Field visits<br>-Population interviews |
| **Result (1)**<br>The monitoring and communication systems of the hydro-meteorological EWS in selected provinces are technologically upgraded | **Indicator (1)**<br>Number of hydro-meteorological stations to be strengthened and automated in the selected provinces<br>**Target value :** at least 20 stations | **Sources of verification (1)**<br>-Equipment procurement invoices<br>-Field visits<br>-Photos of the installed equipment<br>-Stored and measured data reports |
| | **Indicator (2)**<br>Safety level of the surveillance system achieved at the end of the project<br>**Target value :** at least 20% of safety | **Sources of verification (2)**<br>-Pictures of the installation<br>-Field visits<br>-Reports of measured variables and traffic between nodes |

**Assumptions and Risks**

- Technology acquisition by Cuba can be time-consuming because of the market and transportation constraints imposed by the US embargo and a threat to timely implementation.
- Risk of natural hazard affecting one or several of the targeted regions and people involved in the implementation of the project.

| | | |
|---|---|---|
| | **Indicator (3)**<br>Level of safety coverage increased by the introduction of alternative transmission means<br>**Target value :** at least 50% of coverage with VHF | **Sources of verification (3)**<br>-Pictures of the installation,<br>-Field visits<br>-Reports of communication and traffic between nodes |
| **Result (2)**<br>A set of procedures and tools for monitoring, analyzing and forecasting hydro-meteorological hazards established | **Indicator (1)**<br>Data acquisition system<br>**Target value :** at least 2 data sources | **Sources of verification (1)**<br>-Data completion reports<br>-Users feedback |
| | **Indicator (2)**<br>Numerical weather forecast tool<br>**Target value :** one 24 forecast at 3km resolution | **Sources of verification (2)**<br>-Forecast effectiveness<br>-Users feedback<br>-Field visits<br>-Interviews |
| | **Indicator (3)**<br>Interagency data sharing protocol<br>**Target value :** at least 2 protocols | **Sources of verification (3)**<br>-Users feedback<br>-Field visits<br>-Interviews<br>-Traffic logs |
| | **Indicator (4)**<br>Audiovisual product<br>**Target value :** at least 2 products | **Sources of verification (4)**<br>-Photos and videos of products<br>-Population interviews<br>-Field visits |
| **Result (3)**<br>The capacity of local stakeholders, including at the community level, to manage new EWS technologies and perceive risks is strengthened, facilitating access and communication in disaster situations | **Indicator (1)**<br>Number of specialists trained<br>**Target value :** 100 specialists | **Sources of verification (1)**<br>Participant register<br>Training programme<br>Images<br>Compilation of presentations |
| | **Indicator (2)**<br>Number of decision-makers and community representatives trained<br>**Target value :** 266 people | **Sources of verification (2)**<br>Field visits<br>Reports<br>Interviews<br>Photos<br>Training lists<br>Certificates |
| | **Indicator (3)**<br>Number of events seeking to exchange experiences and promote their replication at the international and national levels<br>**Target value :** at least 3 actions | **Sources of verification (3)**<br>Field visits<br>Reports<br>Interviews<br>Photos<br>Training lists<br>Certificates |

**Activity (1-1)**

Identification and acquisition of equipment

**Activity (1-2)**

Refurbishing equipment sites at hydro-meteorological station

**Activity (1-3)**

Installation, testing and start-up of equipment

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**Activity (2-1)**

Identification and acquisition of equipment and software to strengthen the INSMET development group capabilities

**Activity (2-2)**

Refurbishing of INSMET development group premises

**Activity (2-3)**

Development of the procedures and tools

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**Activity (3-1)**

Workshop on project preparation and implementation

**Activity (3-2)**

Update of the HVRS with the support of a Training Center for DRR in the selected provinces

**Activity (3-3)**

Population surveys to validate HVRS as a key component of EWS processes

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**Pre-conditions :**

- Counterparts and DIPECHO partners are willing to coordinate.
- Coordination with national and local counterparts is taking place.
- All involved national and local institutions and government counterparts reaffirm the necessity to collaborate to accomplish the project objective as a priority and they are sufficiently committed.
- UNDP uses the direct execution modality to ensure timely project implementation.

4.3.2.1 Specific Objective

**Specific Objective**

To strengthen the vulnerable components of the EWS, as detected during the passage of hurricane Sandy, and in so doing reduce disaster risks.

**Detailed description**

According to the World Meteorological Organization (WMO): "With a history of recurring disasters, a number of lower income countries such as Bangladesh and Cuba have already made dramatic strides in reducing mortality risk by developing effective early warning systems for tropical cyclones, storm surge and flooding. In Cuba, the government has made the protection of lives their highest priority, investing significantly in the development of the Cuban Tropical Cyclone Early Warning System". However, during the passage of Hurricane Sandy, the EWS of the eastern provinces of the country showed weaknesses, mainly in technological issues. Accordingly, the main priority now is to improve and make more reliable the "hydro-meteorological surveillance system" as part of the monitoring component of the EWS. The other components could also benefit from a technological upgrade, capacity building, development of tools for analysis, forecast and decision making, GIS-based applications, or the updating of risk studies, among others.
The project will cover the following components of the EWS (see annex 4 for a list of actions under each result):
"Hydro-meteorological surveillance system"
Addressing the damage caused by hurricane Sandy to what was already rather obsolete technology will be the main focus of the project. The quality and coverage of the monitoring system will be improved with the upgrading of the measurement system at station level, and by increasing the reliability of the communication system between stations and control/analysis centers (where the risk analysis and forecast functions are performed). See Annex 5.
"Risk analysis and forecast"
The review of the information received from stations (hydro-meteorological surveillance systems) at the meteorological and hydrological control/analysis centers will be improved thanks to new software development. Risk forecasts will also be improved allowing to compare the analysis of the information received from monitoring systems and the updated HVRS, based on software, GIS, and the use of analytical methodology.
"Communication or dissemination of alerts and warnings"
There are effective mechanisms, protocols and regulations already in place under the CD system to receive hydro-meteorological hazard information, and generate and disseminate alerts and warnings down to the community level. This information, however, can be further improved to convey more timely and appropriate messages, and avoid uncertainties in evacuations, unnecessary protection actions and heavy economic losses. To this end:
-A set of procedures and tools will be established for decision-makers, so that they can have access to and disseminate risk-related information and forecasts, and issue relevant warnings.
-Population alerts and warnings will be disseminated over local TV stations and other mass media.
-Local government decision-makers will be trained to manage the information obtained from risk analyses and forecasts.
-RRMC, EWP and multidisciplinary specialist groups will be trained to generate warning and alert proposals for decision-makers, based on updated HVRS.
"Local responsiveness to warnings"
There is high capacity in this component of the EWS. However, the project will share the lessons learnt by the western province of the country (hurricane highest affected region) to the eastern provinces through exchanges and systematization of experiences.
"Risk identification"
Community members, local stakeholders and decision-makers will better identify risks thanks to the exchange of updated HVRS, that seek to raise risk perception and timely and properly respond to alerts and warnings.

**Intermediate report comment**

Was finalized the document with the identification of vulnerabilities and hazards of each weather station in the selected provinces and the measures to prevent such risks, ensuring the functioning of the data receiving equipment during new extreme events.

3 satellite receiving stations for the INSMET were acquired, which have been installed by the specialists of this institution, demonstrating their professional capacity and knowledge in these subjects.

Specialists were trained in situin its functioning, during the setting up and the operation testing by the expert of DARTCOM Company. These stations are already functioning, providing images of 4 km resolution, with 4 spectral bands, which will be used in the preparation of forecasts, climatological studies of drought, monitoring of extreme local events.

In this institution, a Davis model Synoptic Weather Station was also implemented, which will be installed inthe EWP in the selected provinces. This station is piloting the effect of other 12 stations that will be transferred to the territories with the appropriate applications for its use. It is in its testing phase to check temperature data, relative humidity, wind speed and direction, atmospheric pressure, rainfall, dew point, among other parameters, which have been successfully received.

Other advances have been the homologation of RLAN equipments and the formalities to obtain the permission from the Ministry of Communications for wireless communication field testing.

Another significant aspect to highlight is the numerical modeling, which is the basis for making the weatherforecast. For the first time in Cuba, information from radar and satellite isbeing simultaneously assimilated, which directly influences in the quality andaccuracy of the forecast.

A mobile workshop, to facilitatethe access to places which were previously almost impossible to reach due to the terrain characteristics, and a set of tools that will allow the installation of automatic weather stations in the selected provinces were acquired.

A first version of the presentation software for weather on the TV is currently being set-up.

Similarly, electrical materials that are a support for the equipment of automatic stations and VHF radio have been acquired, latter also approved.

Close links between the working groups of the different institutions involved in the project have been maintained, specifically between INSMET and INRH, taking into account that the acquisition of the hydrological stations was delayed due to the economic embargo the United States government applies to Cuba. This situation has led to the identification of new suppliers to acquire thesestations, complying with the technical requirements.

Important to mention the joint efforts and the exchange of knowledge technicians of INSMET, INRH, AMA and CD have systematically maintained.

**Final report comment**

This project has made it possible to strengthen the 4 EWS components thereby guaranteeing the availability of information to all EWS-related actors. Hydro-meteorological surveillance: 15 Hazard, Vulnerability and Risk Studies (HVRSs) were conducted at selected meteorological stations for smooth operation during future events. Was the first activity and propitiated the development of investments to ensure the edification and the vitality of communications (Annex 1) Three satellite stations were established at INSMET for the national meteorological service and includes processing software to generate appropriate outputs for meteorologists. (Annex 2). Were installed in 12 Early Warning Points (EWPs) in the provinces selected a portable meteorological station (Annex 3). A short-term forecast system was developed to connect numerical weather prediction and data collection models. (Annex 6). Automated hydrological and hydraulic modelling has also been developed as part of the INRH strategy to secure early warning to the population and to socio-economic facilities located at watersheds, in cases of heavy rains and overflows. (Annex 7). Transmission and processing systems were updated at the 15 meteorological stations that make up the network of meteorological service stations in the provinces selected (Annex 8). A total of 10 automatic telemetric stations are currently under operation to measure and transmit, in real time, data on precipitation and water level at surface currents and dams on Cauto, the largest watershed in the country. In these hydrological stations has a permanent operator, even during extreme events. Risk perception and decision-making: The preparation of a comprehensive operational procedure has been very important to establish joint action by all EWS-related entities, as well as their roles and responsibilities (Annex 5). Likewise, a set of software tools were developed to manage EWS information flows. The Comprehensive Operational Platform for EWS Information Management (Annex 9) is a tool to ensure the connection between all institutions of the EWS, where each has a specific role in each phase. Were designed various communication protocols to control EWS data flows and outputs for inter-agency product management using the platform. Public Warning: A television software programme was developed for use at the local TV stations in the provinces selected: METTV3 (Annex 10). It is a specialized system for TV meteorological forecasts based on daily predictions. Its modular design makes it possible to manage various types of information. Using state-of-the-art three-dimensional graphic technology, it provides for a high degree of realism. Protection: Community workshops/urban consultations were held to assess and enhance risk perception and preparedness of the population and the institutions for extreme meteorological events (Annex 12). This is complemented with the Disaster Reduction Plans, which cover the adoption of effective preparedness measures. Another communication product involves an educational spot that aims to increase risk perception in the 4 EWS phases. This helps the population to be aware of and implement life-saving actions (Annex 24: https://www.dropbox.com/s/8x0q1he33rjvipx/spot.f4v?dl=0). Another product of great importance to share the results and experiences of the project has been the multimedia published in the website of UNDP Regional for LAC, specifically in the area for DRR: Caribbean Risk Management. Initiative (CRMI) (Annex 25 http://goo.gl/vtWFii). Another example is the Toolbox with the compilation of all products concerning the knowledge management project. They have also provided for systematization (an educational material for meteorological specialists and technicians) (Annex 16)

**Indicator ( 1/4 )**

**Short description**

Coverage of secure communication links at local and national level

**Sources of verification**

-Equipment procurement -Field visits -Network traffic reports -Photos of the installed links

**Target value** At least 47 % of the secure links

**Intermediate value** ongoing

**Final value** 54% of the links are safe

**Detailed description**

This is the basic coverage that ensures the link between the key components of the EWS at local and national level, and the functioning of the EWS depends on it, as was demonstrated with Hurricane Sandy.
This 47% coverage of secure links ensures that 20% of the measuring stations have a safe and reliable link to the provincial center, based on WLAN technology, which is a less vulnerable to extreme weather conditions than the current support (airline telephone) provided by ETECSA. Furthermore, another 50% of these stations will have alternative ways of communication to the provincial center, based on VHF transmission channels. Furthermore, another 50% of these stations will have alternative ways of communication to the provincial center, based on VHF transmission channels.

(See annex 5 for a more detailed description of the coverage of the communication links)

**Intermediate report comment**

The document with the identification of vulnerabilities and hazards of each weather station in the selected provinces and the measures to prevent such risks, ensuring the functioning of the data receiving equipment during new extreme events.

Other advances have been the homologation of RLAN equipment and the formalities to obtain the permission from the Ministry of Communications for wireless communication field testing.

Similarly, electrical materials that are a support for equipment of automatic stations and
VHF radio have been acquired, latter also approved.

**Final report comment**

The coverage of the communication linkshave been strengthened in the institutions of EWS. Initially had envisioned a 47% coverage, but the end result has been 54%. (Annex 17)

Before there were only communication between EWP and CGRR, with the project strengthened communications between all institutions of the EWS.

The communications system has been strengthened through the installation, start-up and operation of new means of communication and the improvement of those under use. A cordless link was established between the Satellite Reception Centre and the National Forecast Centre, as an alternative means of communication seeking to ensure information flows when the primary means are out of order. Cordless equipment was procured. It includes 78 RLAN installed at the national level, that is, at INSMET, INRH, the Cuban Institute of Radio and Television (ICRT), and the Institute of Meteorological Studies under the umbrella of the University of Havana. They were also installed at the provincial level, including the PMCs, the representation offices of INRH, the Risk Reduction Management Centres (RRMCs), local TV stations, direction centres at Defence Councils, and meteorological stations in provincial capital cities. Likewise, other cordless equipment pieces include 20 VHF units at key spots of the hydro-meteorologicalnetwork and 15 GPRS modems at 15 stations of the national network, which were strengthened in the provinces covered.

On the other hand, optical fibre was procured and used to connect the data loggers with the meteorological data storing computers for increased reliability in transmission between these two points over the occurrence of extreme hydro-meteorological events.

It is worth while mentioning that all this technological upgrading effort in the communications system has in some cases preserved traditional means, such as the rain gauge used by voluntary observers. They are in charge of water management using a network that is in line with technical requirements for alternative data supply. They are made up of men and women working at hydrological networks on a permanent basis, in a well-organized, systematic and orderly manner.

**Indicator ( 2/4 )**

**Short description**

Risk prediction procedure improved and properly disseminated (improvement of the communication equipment)

**Sources of verification**

-Prediction effectiveness -Users feedback -Field visits -Interviews

**Target value** At least 2 warnings

**Intermediate value** ongoing

**Final value** 2 procedures for warning

**Detailed description**

The reliability of the analysis and prediction, which are used to decide whether to issue alerts and warnings to the population is a key aspect of EWS. Under this activity the procedures to estimate hazard risks, combining the Hazard, Vulnerability and Risk Studies (HVRS) with numerical weather forecasting outputs, will be defined. Priority will be given to extreme hazards like heavy rains and strong winds.
In the case of rainfall the priority will be to predict floods and landslides when heavy rains, storms and cyclones occur. In the case of strong winds this will be primarily related to hurricanes and storms hazards.
The activity involves specialists to help in developing tools to facilitate the analysis and prediction of risks, it also involves decision-makers and local actors who are trained to interpret this analysis and make decisions.

**Intermediate report comment**

The conclusion document with the HVRS of Weather Stations in the selected provinces was already handed out, properly considering the updating of vulnerabilities and risks for initiating the procedures that allow the articulation of the information issued by the HVRS and EWS. The relationships between HVR plans with weather forecasts have helped the identification in the territories of the importance of the issue of drought as hydrometeorological event.

It is important to recall the continuous communication between specialists and technicians of INSMET and AMA, both institutions belonging to the Ministry of Science, Technology and Environment, for the development of studies and the identification of vulnerabilities of the stations that are technically updated to protect the purchased equipments.

Another significant aspect tomention is the numerical modeling, which is the basis for making the weather forecast. For the first time in Cuba, information from radar and satellite is being simultaneously assimilated, which directly influences in the quality and accuracy of the forecast.

The work domain, on which the numerical forecasts will be made, was designed. This domain will have are solution of 1km. This domain will feed on the runs with 27, 9 and 3km resolution, using data assimilation of stations and polls.

Currently, works are being undertaken to automate the receipt of the data in the desired format and to assimilate them automatically in the models. Test radars that are being usedare Casablanca and Camagüey. In addition, works are underway on the conversion of the data received by the satellite stations to assimilate them in the models.

**Final report comment**

Reliable analysis and appropriate prediction are key EWS elements. A comprehensive operational procedure has therefore been developed for hydro-meteorological forecasts (Annex 5), including risk, threat, hazardand vulnerability estimations, as wellas Hazard, Vulnerability and Risk Studies (HVRSs), with weather numericalprediction outputs. Special attention is paid to extreme hazards such as heavy rains and strong winds.
Rain forecast is given top priority because it is really important to predict floods and landslides over storms and cyclones. On the other hand, strong windsare directly related to hurricanes and storms.
This procedure provides a major tool to facilitate risk forecast, analysis and prediction, and helps local actors and decision-makers to issue timely messagesfor the population and make appropriate decisions for the protection of individuals and property.

It contains guidelines and measures for the four EWS stages at the national and local levels:

Surveillance and Forecast

With the event approaching

Within 48 hours of the impact of a meteorological event or when it is expected to hit the country as a tropical storm

Over the impact

Risk perception and decision-making

Dissemination of public messages

Protection measures

Numerical modelling (Annex 6) makes it possible to develop a forecast system by connecting weather numerical prediction models with data generation. For the latter, it is vitally important to incorporate meteorological station information and satellite images. These sources of data have been strengthened with equipment and software that have been supplied under the project. This modelling is based on the use of advancednumerical methods to solve equation systems that describe physical processes inthe atmosphere, builds upon software engineering, and includes breakthroughs in short-term actions. All this integration process provides for simulations everysix hours under multivariable analysis, and incorporates three-dimensional atmospheric information.

**Indicator ( 3/4 )**

**Short description**

Level of preparedness of stakeholders

**Sources of verification**

-Field visits -Reports -Photos -Interviews
-Training lists -Certificates

**Target value** 396 stakeholders

**Intermediate value** ongoing

**Final value** 396 stakeholders

**Detailed description**

This too will be a determining aspect, as it relates to the technical preparedness (professional training, etc.) of the stakeholders that will ensure the effectiveness of the EWS.
It includes building the capacity of 156 community representatives from vulnerable communities, 100 specialists to ensure the monitoring, analysis and prediction system, and 110 decision-makers who receive the information and need to decide to issue alerts and warnings. Also, 30 Environmental Agency (AMA) experts will contribute to the use of HVRS to make better predictions and analysis and contribute to the risk perception of decision makers and the community.
It includes exchanges of experiences and lessons learned on effective evacuations with actors from other regions of the country.
Finally, the level of preparedness of stakeholders to hydro-meteorological hazards will be evaluated in coordination with the local CD in the drill "Meteoro 2014" (i.e. a nationwide Civil Defense drill which is carried out every year before June 1st, i.e. prior to the start of the hurricane season in the Western hemisphere).

**Intermediate report comment**

March 2013, INSMET National Workshop on updating the technology of automatic stations to be installed inthe territories took place, with the participation of principals and vice-principals of the 4 Meteorological Centers of the selected provinces.

March 2013, it was also developed by AMA, a training exercise with regional specialists of Environment and local decision makers in order to prepare them inthe proper use of HVRS to make possible more realistic scenarios and to help increase risk perception took place.

**Final report comment**

The technical and professional training of national and local actors under the project guarantees the effectiveness of the hydro-meteorological EWS. 156 community representatives, 100 specialists to ensure the monitoring, analysis andprediction system, and 110 decision-makers who receive the information and needto decide to issue alerts and warnings. Also 30 Environmental Agency (AMA) experts will contribute to the use of HVRS. (Annex 18)
A key role in this connection was played by Meteor2014, a national drill that is jointly organizedby Civil Defence at the beginning of the six months long hurricane season (June1st through November 30th). It involved specialists and technicians, and madeit possible to implement the comprehensive operational procedure forhydro-meteorological forecasts, including hazard-related information. In this context, EWS-related actors at the national and provincial levels (including the four provinces selected) assessed the actions that have been carried out to strengthen hydro-meteorological forecast and surveillance, as well as the proposals that have been formulated to increase the effectiveness ofdecision-making processes, the dissemination of messages, and the adoption of measures to protect the population and property at risk.

Given the importance of the mass media in the preparedness and response stages, journalists and other professionals who supply public information over extremenatural events were properly trained. Emphasis was made on the ways and means of increasing the effectiveness of public messages in the disaster-response phase.

The training actions designed for representatives of vulnerable communities were successfully implemented in coordination with UN-Habitat, applying the urban consultation methodology on a local scale, seeking to assess and enhance the risk perception and preparedness of the population and the institutions for extreme hydro-meteorological events.

Anotherhighlight had to do with the training of specialists to guarantee the smooth operation of data analysis, management and dissemination, and effective prediction control systems. It also covered equipment assembly, operation and maintenance for EWS strengthening.

The integrated hazard & hydro-meteorological forecast was a new development very much welcomed by decision-makers, who are responsible for the issuance of warnings to the population and economic facilities.

Local AMA units provided training and updating on HVRS relevance and implementation.These studies help to identify local vulnerabilities and conduct event-specific scenario analyses

**Indicator ( 4/4 )**

**Short description**

Local television broadcasting stations are provided with the software required to report the weather

**Sources of verification**

-Television images and videos of weather forecasting -Field visits -Population interviews

**Target value** At least 4 television stations

**Intermediate value** ongoing

**Final value** 4 television stations

**Detailed description**

This aspect will play a key role in the communication phase, when transmitting messages to the population to prepare them for the alarm stage when there will be no electricity and to relay on alternative means.
It is estimated that this information reaches at least 80% of the population identified as vulnerable by the HVRS, which is equivalent to about 436,617 people. This takes into account electrification indicators of the area, the television signal coverage and the ownership of TV sets at the household level.
The audiovisual product generated for this purpose, is based on a previous version developed by INSMET technicians in the province of Cienfuegos who were advised by national experts. It incorporates lessons learned and will be upgraded at INSMET headquarters for replicationin the eastern provinces.
TV can also play a decisive role in raising awareness of the risks and improve risk perception. Likewise, it can be very useful for transmitting lessons and experiences to influence the behavior and knowledge of people during evacuation processes.
A set of tools to be used by local TV stations will also be developed in order to improve the presentation of the weather forecasts and to

communicate the highly technical hydro-meteorological information in a way that the public can easily understand. A more advanced graphical program will allow creating more attractive graphics and animations. It will introduce new graphical products (pictograms and colored coded maps) to disseminate warnings in a format suited to the audience. It will also introduce a tool to generate scrolling text tapes to broadcast warnings in timely manner.

**Intermediate report comment**

Part of the necessary equipment to improve television audiovisual product that will be introduced by software developers of INSMET was already acquired. A first version of the presentation software of the weather on TV is being finalized. The major impact of this result has been made visible by the authorities of INSMET in the national press.
http://www.radiorebelde.cu/noticia/novedoso-software-cienfuegos-parte-meteorologico-nacional-20140320/.

**Final report comment**

The 4 local TV stations in the provinces selected were strengthened with equipment for integrated hydro-meteorological forecasts under normal and disaster situations and in real time. Provincial TV centres inthe areas covered were previously strengthened for this purpose; they now have data processing and video equipment for improved technological services.

This proposal was developed by PMC specialists in the province of Cienfuegos and by national experts incollaboration with ICRT specialists and provincial TV stations in the provinces covered. It has incorporated the lessons learned in joint work between INSMET (local representation offices) and TV stations. The information is nowbeing supplied in a way that viewers easily understand it, using attractive 3D graphics and animations (Annex 10).

The PMCs and local TV stations play adecisive role in raising awareness about local risks and improving risk perception. The new services increase the knowledge of the population aboutthe formation and development of hydro-meteorological events and the measures to be taken under evacuation processes. This is very instrumental in the EWS communication phase, as TV is a mass medium that reaches many people.

Another valuable tool is associated with a software programme that automatically generates hydro-meteorological texts inreal time. They are displayed on regular TV shows to disseminate natural disaster warnings.

They reach 80 percent of the populationthat is identified as vulnerable by HVRSs, totalling 436.617 people, taking into account TV signal coverage and number of household TV sets.

4. OPERATIONAL FRAMEWORK

4.3.2.2 MORE DETAILED INFORMATION PER RESULT - Result (1)

## Details

**Result's short description**

The monitoring and communication systems of the hydro-meteorological EWS in selected provinces are technologically upgraded

| | |
|---|---|
| **Total amount** | 394.220,00 € |
| **[INT] Total amount** | 151.323,62 € |
| **[FIN] Total amount *** | 394.220,00 € |

| | |
|---|---|
| **Sector** | Disaster Risk Reduction / Disaster Preparedness |
| **Sub-sectors** | Local disaster management components |

| | |
|---|---|
| **Number of beneficiaries** | 150.400 |
| **Intermediate number of ben.** | 150.400 |
| **Final actual number** | 150.400 |
| **Status of beneficiaries** | IDP ☐ Population ■ Refugees ☐ Returnees ☐ Others ■ |

**Detailed description**

Experts at the INSMET have analyzed the most suitable technologies for WS. To ensure compliance with the standards recommended by the WMO, to maintain the homogeneity of the INSMET observation network, and to facilitate the maintenance by local staff, the same AWS models that were installed between 2011 and 2012 with the support of the DIPECHO project in Granma province will be acquired. Specialists from the INSMET headquarters will update their knowledge and, in turn, will adapt the selected equipment to be operated under the environmental and exploitation conditions of Cuba (tailor made). Subsequently, the INSMET specialists will train local technicians on the installation, exploitation and use of the technology acquired.
The upgrading of the hydro-meteorological surveillance system in the eastern provinces will decrease the time required to collect, process and analyze the monitored data, it will increase the quantity and quality of data, and will improve the effectiveness of the analysis and forecasts allowing the issuance of timely decisions and warnings to the population.
Areas without representative meteorological data will be covered with meteorological satellite information broadcasted. In addition to supporting weather forecasting in the eastern provinces, these satellite products can be used to monitor other threats such as drought, forest fires, etc.
As part of the technological strengthening of the EWS, the transmission network carrying hydro-meteorological information between stations, processing and decision making centers at local and national level, will be made more reliable and its capacity increased.
Has been considered the role of the RRMC and EWP network as part of the EWS.

**Intermediate report comment**

Finalized the HVRS in the selected provinces. A final document with all the reports of these studies have been completed.

3 satellite receiving stations for the INSMET were acquired, which have been installed by the specialists of this institution, demonstrating their professional capacity and knowledge in these subjects.

After installing the system, specialists were trained in situ in its functioning, during the setting up and the operation testing by the expert of DARTCOM Company. These stations are already functioning, providing images of 4 km resolution, with 4 spectral bands, which will be used in the preparation of forecasts, climatological studies of drought, monitoring of extreme local events.

Another significant aspect to highlight is the numerical modeling, which is the basis for making the weather forecast. For the first time in Cuba, information from radar and satellite is being simultaneously assimilated, which directly influences in the quality and accuracy of the forecast.

In this institution, a Davis model Synoptic Weather Station was also implemented, which will be installed in the Early Warning Point (EWP) in the selected provinces. This station is piloting the effect of other 12 stations that will be transferred to the territories with the appropriate applications for its use. It is in its testing phase to check temperature data, relative humidity, windspeed and direction, atmospheric pressure, rainfall, dew point, among other parameters, which have been successfully received.

Other advances have been the homologation of RLAN equipments and the formalities to obtain the permission from the Ministry of Communications for wireless communication field testing.

Close links between the working groups of the different institutions involved in the project have been maintained, specifically between INSMET and INRH, taking into account that the acquisitionof the hydrological stations was delayed due to the economic embargo the United States government applies to Cuba. This situation has led to the identification of new suppliers to acquire these stations, complying with the technical requirements.

**Final report comment**

The upgrade of the hydro-meteorological surveillance system in the eastern provinces improving the quality of surveillance, decision-making, and population warnings. In this regard, 3 satellite stations were established at INSMET for the national meteorological service and includes a processing software programme to generate appropriate outputs for meteorologists. This equipment makes it possible to update the information relevant to Cuba every 15 minutes, with a 4-kilometre resolution on water vapour, infrared and visible bands. The procurement of additional processing software licences has had a great impact in the provinces covered by the project. A portable meteorological station was installed at INSMET. It is the same model as the one under operation at the 12 EWPs in the provinces selected. Variables such as relative air temperature and humidity, wind speed and direction, atmospheric pressure are being automatically measured at these stations. Specialized computing equipment was also procured to strengthen INSMET EWS-related centres at the national level. They include the National Forecast Centre, the Atmospheric Physics Centre, the Climate Study Centre, and the Observation Instruments and Methods Centre. The provincial PMCs have also seen their EWS-related teams strengthened due to the important role they play in forecasting, networking and meteorological-station operation. Transmission and processing systems were updated at the 15 meteorological stations that make up the network of meteorological service stations in the provinces selected. Another highlight has to do with the development of a numerical modelling software package, that is, the use of advanced numerical methods to solve equation systems that describe physical processes in the atmosphere and provide the basis for weather forecasts. A motorized shop was procured for the national meteorological service. It includes a set of specialized tools. The motorized shop supports assembly works and equipment start-up, operation and maintenance at the network of stations in the provinces covered, as well as compliance with minor-repair and quality standards at the network. A total of 10 automatic telemetric stations are currently under operation to measure and transmit, in real time, data on precipitation and water level at surface currents and dams on Cauto, the largest watershed in the country. The communications system has been enhanced through the installation and operation of new means of communication and the improvement of those working at present. The wireless link is an alternative means of communication to ensure information flows; were procured 78 RLAN installed at the national level, that is, at INSMET, INRH, ICRT, and the Institute of Meteorological Studies. They were also installed at the provincial level, including the PMCs, the offices of INRH, the RRMCs, local TV stations, direction centres at Defence Councils, and meteorological stations in provincial capital cities. Likewise, other cordless equipment pieces include 20 VHF units at the hydro-meteorological network and 15 GPRS modems at 15 stations of the national network, which were strengthened in the provinces covered. On the other hand, optical fibre was procured and used to connect the data loggers with the meteorological data storing computers for increased reliability in transmission between these two points over the occurrence of extreme hydro-meteorological events. HVRSs were conducted at each of the 15 meteorological stations in the provinces selected to identify their risks and vulnerabilities to extreme hydro-meteorological events and to landslides, and adopt the relevant risk prevention measures, securing the smooth operation of the equipment installed for future events (Annex 1)

## Objectively verifiable indicators

**Indicator ( 1/3 )**

**Short description**

Number of hydro-meteorological stations to be strengthened and automated in the selected provinces

**Sources of verification**

-Equipment procurement invoices
-Field visits
-Photos of the installed equipment
-Stored and measured data reports

| | |
|---|---|
| **Target value** | at least 20 stations |
| **Intermediate value** | ongoing |
| **Final value** | 25 hydro-meteorological stations |

**Detailed description**

At present, there are 15 surface meteorological stations operated manually by observers doing one observation every 3 hours, every day of the year. These stations collect synoptic data representative of the weather for 75% (22 000 square km) of the total area of the eastern region of the country.
It is expected to automate at least 10 WS (67% of the total number in the selected provinces) reducing the frequency of observation from 3 hours to 10 minutes and guaranteeing the continuity of the observations in case of evacuation of personnel.
The plan is to install 10 new measurement points to improve the hydrological monitoring system of the most important basin in the East, hence reducing the risks of people living downstream. The frequency of observation in the new hydrological points is changed from 1 daily report to 1 observation every 10 minutes.
Wireless communications between the monitoring equipment mounted outdoor and control computers will reduce the risk of damage from electrical shock and facilitate their integration into the INSMET data network.
An alternative way of data transmission between stations and processing centers at local level will be established, ensuring at least the coverage of: WLAN (20%), VHF (50%) and cell phone (60%). By using the WS of La Gran Piedra Mountain as a repeater for the entire region, the province of Santiago de Cuba will be guaranteed a 100% VHF coverage.

**Intermediate report comment**

The electrical material to ensure the place for technological equipment was acquired. This technological equipment will update weather monitoring system in the selected stations. It is in process of acquisition, the station components for receiving and processing data.

The hydrological stations equipment is under acquisition phase, because a delay due the economic embargo applied to Cuba by the U.S.A. At the beginning we intend to acquire OTT stations, because this German company is a leader at international market on building hydro meteorological measurement equipment. Later, when we contact them to acquire the equipment, we found that the economic embargo applied to Cuba by the U.S.A government prohibited this action. Then, the project have to move forward to identified another supplier of the hydrological stations needed.

**Final report comment**

Were automated 15 weather stations in 15 selected provinces and were installed 10 new automatic hydrological stations in the most important Cuenca in eastern Cuba.

Wireless communications are secured

In the 15 meteorological stations were performed the HVRSs to identify their risks and vulnerabilities to extreme hydro-meteorological events and to landslides, and adopt the relevant risk prevention measures, securing the smooth operation of the equipment installed for future events. The supply also included electrical material to support the climate monitoring system at the stations that have been selected for data collection and processing. A portable meteorological station was installed at INSMET. It is the same model as the one under operation at the 12 EWPs in the provinces selected. Variables such as relative air temperature and humidity, wind speed and direction, atmospheric pressure, cumulative precipitation, and dew point are now being automatically measured at these stations Specialized computing equipment was also procured to strengthen the provincial PMCs due to the important role they play in forecasting, networking and meteorological-station operation Transmission and processing systems were updated at the 15 meteorological stations that make up the network of meteorological service stations in the provinces selected. Hardware components at transmission systems, which support communication between data loggers and data-receiving computers, were also brought to date, as were some hardware components at processing systems and data management software programmes.

Another 10 measuring points were established to improve the hydrological monitoring system at the Cauto Watershed and reduce the risks facing the population downstream. The frequency of observation at the new hydrological points changed from one a day to one every 10 minutes.

Transmission and processing systems were updated at the 15 meteorological stations that make up the national network of meteorological service stations. Hardware components at transmission systems, which support communication between data loggers and data-receiving computers, were also brought to date, as were some hardware components at processing systems and data management software programmes.

The communications system has been enhanced through the installation and operation of new means of communication and the improvement of those working at present. A cordless link was established as an alternative means of communication to ensure information flows. It includes 78 RLAN installed at the national level, that is, at INSMET, INRH, ICRT, and the Institute of Meteorological Studies of Havana. They were also installed at the provincial level, including the PMCs, the offices of INRH, the RRMCs, local TV stations, direction centres at Defence Councils, and meteorological stations in provincial capital cities. Likewise, other cordless equipment pieces include 20 VHF units at the hydro-meteorological network and 15 GPRS modems at 15 stations of the national network, which were strengthened in the provinces covered.

On the other hand, optical fibre was procured and used to connect the data loggers with the meteorological data storing computers for increased reliability in transmission between these two points over the occurrence of extreme hydro-meteorological events.
The collection and storage software programmes include those associated with automatic and semi-automatic meteorological stations (SISMAT), as well as satellite product acquisition modules, numerical model outputs, and condition of dams and automatic hydrological stations. They are all contained in the Comprehensive Operational Platform for EWS Information Management

**Indicator ( 2/3 )**

**Short description**

Safety level of the surveillance system achieved at the end of the project

**Sources of verification**

-Pictures of the installation
-Field visits
-Reports of measured variables and traffic between nodes

| | |
|---|---|
| **Target value** | at least 20% of safety |
| **Intermediate value** | ongoing |
| **Final value** | 100% of safety |

**Detailed description**

To ensure the proper functioning of the surveillance system under extreme weather conditions, the following things will be done:
- Secure the supporting structure of the measurement instruments, communications antennas and other equipment installed outdoors.
- Replace the bulky wooden Stevenson screen with a light plastic one for temperature sensors.
- Create an alternative way of data transmission between stations and processing centers at local level with a 20% of coverage supported by WLAN links.
The safety level of the surveillance system can be guaranteed at 20% based on the weakest link (WLAN coverage), because the other are fully guaranteed.
(See annex 5 to view a full description of the coverage of the data network)

**Intermediate report comment**

The report of the HVRS of WS issued by AMA has presented the indicators to eliminate vulnerabilities identified for each WS.
Actions to be taken for the safety of WS have been coordinated with INSMET general director and his group of assistants, advisors and vice principals, as well as with provincial directors, in a meeting held on March 2014, 13th at the offices of UNDP. See Annex 7.

**Final report comment**

Considering that the 5 institutions of the EWS in each province have been strengthened with WLAN, communication between them is 100% secure. A coverage and security study over the installation of a WLAN network between and among provincial EWS-related institutions was conducted in collaboration with Antsys Copextel, a local entity under the umbrella of the Ministry of Communications. In this context, the equipment necessary for reliable data transmission from each node was procured, taking into account the HVRS recommendations on every location.

The communications system has been enhanced through the installation and operation of new means of communication and the improvement of those working atpresent. A cordless link was established between the Satellite Reception Centre and the National Forecast Centre, as an alternative means of communication seeking to ensure information flows when the primary means areout of order. Cordless equipment was procured. It includes 78 RLAN installed atthe national level, that is, at INSMET, INRH, the Cuban Institute of Radio and Television (ICRT), and the Institute of Meteorological Studies under the umbrella of the University of Havana. They were also installed at the provincial level, including the PMCs, the representation offices of INRH, the Risk Reduction Management Centres (RRMCs), local TV stations, direction centres at Defence Councils, and meteorological stations in provincial capital cities.

On the other hand, the data transmission systems that have been developed include the use of means of communication that have been strengthened under the project and various communication protocols to control EWS data flows andoutputs. These protocols cover https and ftp for inter-agency product management using the platform. Data exchange between and among meteorological stations is conducted under tcp/ip protocols for LAN and WAN connections

**Indicator ( 3/3 )**

**Short description**

Level of safety coverage increased by the introduction of alternative transmission means

**Sources of verification**

-Pictures of the installation,
-Field visits
-Reports of communication and traffic between nodes

| | |
|---|---|
| **Target value** | at least 50% of coverage with VHF |
| **Intermediate value** | ongoing |

**Final value** 50% guaranteed

**Detailed description**

Taking into account the current limitations to properly ensure the communication of all the links between measurement stations and the provincial meteorological center, the plan is to increase the safety coverage to 50% by introducing an alternative transmission way supported by VHF.

**Intermediate report comment**

VHF radio equipments that were approved was purchased. The equipment is in the distribution phase to the provinces selected for later installation.

**Final report comment**

The communications system has been enhanced through the installation and operation of new means of communication. Wereprocured, including 20 VHF units at the hydro-meteorological network. These communication equipment provide coverage to points of great importance in the EWS. Of great impact have been distributed to 8 INRH volunteer observers in Santiago de Cuba province.

Likewise as value added, other cordless equipment pieces and 15 GPRS modems at 15 stations of the national network, which were strengthened in the provinces covered. On the other hand, opticalfibre was procured and used to connect the data loggers with the meteorological data storing computers for increased reliability in transmission between these two points over the occurrence of extreme hydro-meteorological events

## Activities

### Activity ( 1/5 )

**Short description**

Identification and acquisition of equipment

**Start date** 15/06/2013

**End date** 01/02/2014

**Detailed description**

Identification and acquisition of specialized equipment for monitoring, communication and processing of hydro-meteorological data. The type of equipment will be determined on the basis of a cost-benefit analysis, studies of current technologies, and the need to maintain and operate it under Cuba environmental conditions, especially those referring to extreme weather.
Identification and acquisition of a motor vehicle with the tools and laboratory equipment needed to make it a mobile laboratory. This is to be used by the specialist staff of the project to timely install all the equipment and to ensure the sustainability of the national monitoring system by facilitating its periodic maintenance and the calibration of its sensors.

**Intermediate report comment**

Finalized the HVRS in the selected provinces. A final document with all the reports of these studies have been completed.

3 satellite receiving stations for the INSMET were acquired, which have been installed by the specialists of this institution, demonstrating their professional capacity and knowledge in these subjects.

After installing the system, specialists were trained in situ in its functioning, during the setting up and the operation testing by the expert of DARTCOM Company. These stations are already functioning, providing images of 4 km resolution, with 4 spectral bands, which will be used in the preparation of forecasts, climatological studies of drought, monitoring of extreme local events

Another significant aspect to highlight is the numerical modeling, which is the basis for making the weather forecast. For the first time in Cuba, information from radar and satellite is being simultaneously assimilated, which directly influences in the quality and accuracy of the forecast.

In this institution, a Davis model Synoptic Weather Station was also implemented, whichwill be installed in the EWP in the selected provinces.This station is piloting the effect of other 12 stations that will be transferred to the territories with the appropriate applications for its use. It is in its testing phase to check temperature data, relative humidity, windspeed and direction, atmospheric pressure, rainfall, dew point, among other parameters, which have been successfully received.

Other advances have been the homologation of RLAN equipments and the formalities to obtain the permission from the Ministry of Communications for wireless communication field testing.

Close links between the working groups of the different institutions involved in the project have been maintained, specifically between INSMET and INRH, taking into account that the acquisition of the hydrological stations was delayed due to the economic embargo the United States government applies to Cuba. This situation has led to the identification of new suppliers to acquire these stations, complying with the technical requirements.

**Final report comment**

3 satellite stations were established at INSMET for the national meteorological service (Annex 2). The additional processing software licences have had a great impact. These software programmes will be used in the provinces covered by the project, independently of the national headquarters.

A portable meteorological station was installed at INSMET. It is the same model as the one under operation at the 12 Early Warning Points (EWPs) in the provinces selected (Annex 3).

At the same time, the 15 meteorological stations that make up the network of meteorological service stations in the provinces selected were automated.

A motorized shop was procured for the national meteorological service, including a set of specialized tools. The motorized shop supports assembly works and equipment start-up, operation and maintenance at the network of stations in the provinces covered, as well as compliance with minor-repair and quality standards (Annex 4).

A total of 10 automatic telemetric stations are currently under operation to measure and transmit, in real time, data on precipitation and water level at surface currents and dams on Cauto, the largest watershed in the country.

The communications system has been enhanced through the installation and operation of new means of communication and the improvement of those working at present. A cordless link was established as an alternative means of communication to ensure information flows Cordless equipment was procured; it includes 78 RLAN installed at the national and provincial level. Likewise, other cordless equipment pieces include 20 VHF units at the hydro-meteorological network and 15 GPRS modems at 15 stations of the national network, which were strengthened in the provinces covered.

On the other hand, optical fibre was procured and used to connect the data loggers with the meteorological data storing computers for increased reliability in transmission between these two points over the occurrence of extreme hydro-meteorological events.

Local specialists were trained by experts at a seminar held at one of the facilities of the Academy of Ubiquiti (Ecuador). The knowledge they gained is vitally important to project implementation, because this technology is applied to connect all the nodes involved in the EWS information transmission network in the provinces selected. Such nodes belong to various local institutions that participate in the process of measurement, processing, decision-making and TV presentation of EWS hydro-meteorological warnings, which now have a direct communication link.

It is important to point the experience of INRH Voluntary Observers. They are in charge of water management using a rain-gauge network

in line with technical requirements for alternative data supply.

INSMET specialists also participated in international training courses to update their knowledge about assembly, start-up and maintenance of wireless and satellite transmission technology.

Likewise, local decision-making centres that are part of the EWS network have been strengthened with new equipment and increased reliability in their capacities. The National Civil Defence General Staff (EMNDC) also received essential equipment for surveillance and monitoring of hydro-meteorological events.
At the same time, HVRSs were conducted at each of the 15 meteorological stations in the provinces selected (Annex 6) to identify their risks and vulnerabilities to extreme hydro-meteorological events and to landslides, and adopt the relevant risk prevention measures, securing the smooth operation of the equipment installed for future events

**Activity ( 2/5 )**

**Short description**

Refurbishing equipment sites at hydro-meteorological station

**Start date** 15/06/2013

**End date** 01/01/2014

**Detailed description**

Equipment, facilities and furniture at hydro-meteorological stations will be refurbished to ensure proper and safe operation in the event of extreme weather conditions.

**Intermediate report comment**

The electrical equipment that ensures the operation of weather stations was acquired.
The process of acquisition of the other equipment and furniture continues.

**Final report comment**

The hydrological stations were refurbished for the installation of equipment and its smooth, safe operation under extreme weather conditions. Pieces of furniture were also procured for computer equipment.

The communications system has been enhanced through the installation and operation of new means of communication and the improvement of those working at present. A cordless link was established between the Satellite ReceptionCentre and the National Forecast Centre, as an alternative means of communication seeking to ensure information flows when the primary means are out of order. Cordless equipment was procured, including 78 RLAN installed at the national level, that is, at INSMET, INRH, the Cuban Institute of Radio andTelevision (ICRT), and the Institute of Meteorological Studies under the umbrella of the University of Havana. They were also installed at theprovincial level, including the PMCs, the representation offices of INRH, the Risk Reduction Management Centres (RRMCs), local TV stations, direction centresat Defence Councils, and meteorological stations in provincial capital cities. Likewise, other cordless equipment pieces include 20 VHF units at the hydro-meteorological network and 15 GPRS modems at 15 stations of the national network, which were strengthened in the provinces covered.

On the other hand, optical fibre was procured and used to connect the data loggers with the meteorological data storing computers for increased reliability in transmission between these two points over the occurrence of extreme hydro-meteorological events.

Contingency modules were procured to guarantee appropriate living conditions for specialists at hydro-meteorological stations over extreme events.

**Activity ( 3/5 )**

**Short description**

Installation, testing and start-up of equipment

**Start date** 01/09/2013

**End date** 01/04/2014

**Detailed description**

12 WS will undergo maintenance works according to the guidelines of the HVRS to protect them and ensure their operation under extreme weather conditions. Subsequently, the equipment procured will be installed and tested to ensure a stable and reliable operation from the start-up.

**Intermediate report comment**

In this institution, a Davis model Synoptic Weather Station was also implemented, which will be installed inthe EWP in the selected provinces. This station is piloting the effect of other 12 stations that will be transferred to the territories with the appropriate applications for its use. It is in its testing phase to check temperature data, relative humidity, wind speed and direction, atmospheric pressure, rainfall, dew point, among other parameters, which havebeen successfully received.

The report of the HVRS of WS issued by AMA has presented the indicators to eliminate vulnerabilities identified for each WS.
Actions to be taken for the safety of WS have been coordinated with INSMET general director and his group of assistants, advisors and vice principals, as well as with provincial directors, in a meeting held on March, 13th at the offices of UNDP.

**Final report comment**

Twelve portable meteorological stations (DAVIS) were installed at 12 EWPs in the provinces selected and one, at INSMET. Variables such as relative air temperature and humidity, wind speed and direction, atmospheric pressure, cumulative precipitation, and dew point are now being automatically measured at these stations.

Specialized computing equipment was also procured to strengthen INSMET EWS-related centres at the national level. They include the National Forecast Centre, the Atmospheric Physics Centre, the Climate Study Centre, and the Observation Instruments and Methods Centre. The provincial PMCs have also seen their EWS-related teams strengthened due to the important role they play in forecasting, networking and meteorological-station operation.

Transmission and processing systems were updated at the 15 meteorological stations that make up the network of meteorological service stations in the provinces selected. Hardware components at transmission systems, which support communication between data loggers and data-receiving computers, were also brought to date, as were some hardware components at processing systems and data management software packages.
Likewise, HVRSs were conducted at each of the 15 meteorological stations in the provinces selected to identify their risks and vulnerabilities to extreme hydro-meteorological events and to land slides, and adopt the relevant risk prevention measures, securing the smooth operation of the equipment installed for future events

**Activity ( 4/5 )**

**Short description**

Technology transfer to national experts and local technicians on installation, configuration and maintenance of equipment

**Start date** 15/06/2013

**End date** 01/04/2014

**Detailed description**

Technology transfer of hydro-meteorological monitoring systems to national experts. As part of the training of the EWP staff, will include special training for handling measurement equipment.

**Intermediate report comment**

The homologation process of the RLAN sample was approval at the end of March 2014; therefore, the transfer of this technology to local technicians was postponed for the second quarter of 2014, during field testing in the selected provinces of the project.

At the moment specialists INSMET INRH set with CD and work in the preparation of training programs for technicians and decision makers in thematic and wireless communications (GPRS, VHF, WLAN), Weather Stations (Thies, HUATRON,DAVIS) satellites (LRIT VA, GEONETCAST, EUMETCast), software Applications (TV, Platform) Procedures and Interagency joint Action (Interactions INRH, INSMET, AMA, DC)

**Final report comment**

The transfer of hydro-meteorological monitoring system technology to national experts had a great impact on the project. Thiswireless technology provides one of the best choices for cordless communication systems due to its great resistance to extreme weather conditions, versatility of configurations, scalability in solutions, new application of integratedsystems for improved performance, among many other features that turn it into an elite technology on a world scale. 3 Local specialists were trained by expertsat a seminar held at one of the facilities of the Academy of Ubiquiti (Ecuador)(Annex 19). The knowledge they gained is vitally important to project implementation, because this technology is applied to connect all the nodes involved in the EWS information transmission network in the provinces selected. Such nodes belong to various local institutions that participate in the processes of measurement, processing, decision-making and TV presentation of EWS hydro-meteorological warnings, which now have a direct communication link.

Another important action was related to the process of installation, preparation and start-up of satellite receivers at INSMET. The training sessions that were organized for this purpose made it possible to ensure appropriate installation, configuration, data-security levels, and hardware components that may be affected by lightning.

The University of Valladolid (Spain) provided training to 2 INSMET specialists onthe correct use and operation of satellite receivers to offer hydro-meteorological services in real time to EWS users. The topics that were discussed included hardware components maintenance, operation and upgrading, as well as service configurations for forecast numerical models, climate studies, multivariable monitoring, and detection of severe storms.

On theother hand, INRH specialists were trained to assemble, start-up and maintain hydrological stations at the Cauto Watershed and keep their services running (Annex20).

**Activity ( 5/5 )**

**Short description**

HVRS to decrease the WS vulnerabilities

**Start date** 15/06/2013

**End date** 01/04/2014

**Detailed description**

All these stations will conduct HVRS which provide guidance to protect the building and the equipment in case of extreme weather conditions. These studies will be carried out by experts of the AMA. One of the actions to be implemented under the project seeks to overcome the vulnerability of communications between the stations and the PMC.

**Intermediate report comment**

HVRS of the selected WS were concluded. There were performed by AMA specialist in the four provinces. The final document was submitted with indications of vulnerabilities, risks, and hazards, to be considered for the placement of the equipments as well as the ensuring of WS to face new extreme events.

**Final report comment**

HVRSs were conducted at meteorological stations, including protection measures and recommendations for buildings and equipment under extreme weather conditions. See Annex 21 with this methodology of HVRS
One of the main actions that have been implemented under this project sought to overcome vulnerabilities in communications. The communications system has been strengthened through the installation, start-up and operation of new means of communication and the improvement of those under use. A cordless link was established between the Satellite Reception Centre and the National Forecast Centre, as an alternative means of communication seeking to ensure information flows when the primary means are out of order. Cordless equipment was procured, including 78 RLAN installed at the national level, that is, at INSMET, INRH, the Cuban Institute of Radio and Television (ICRT), and the Institute of Meteorological Studies under the umbrella of the University of Havana. They were also installed at the provincial level, including the PMCs, the representation offices of INRH, the Risk Reduction Management Centres (RRMCs), local TV stations, direction centres at Defence Councils, and meteorological stations in provincial capital cities. Likewise, other cordless equipment pieces include 20 VHF units at key spots of the hydro-meteorological network and 15 GPRS modems at 15 stations of the national network, which were strengthened in the provinces covered.
On the other hand, optical fibre was procured and used to connect the data loggers with the meteorological data storing computers for increased reliability in transmission between these two points over the occurrence of extreme hydro-meteorological events.

## Means and costs

### Mean ( 1/4 )

**Short description**

Specialized equipment

| | |
|---|---|
| **Costs** | 281.760,00 € |
| **Intermediate report amount** | 74.725,62 € |
| **Final report committed** | 281.092,06 € |

**Detailed description**

Specialized equipment for measuring, processing, storage, and transmission of hydro-meteorological information. This equipment includes a satellite receiving ground station installed at INSMET and a pack of software licenses to manage the downloaded data at eastern provinces.

**Intermediate report comment**

The satellite receiving stations, the mobile workshop, tools, VHF radios, and a sample of the RLAN equipments have been acquired. They are being tested to purchase the rest of the needed equipments, and the electrical material. Close links between the working groups of the different institutions involved in the project have prevailed, especially between INSMET and INRH, taking into account that the acquisition of the hydrological stations was delayed due to the economic embargo the United States government applies to Cuba. This has led to the identification of new suppliers to acquire these stations, complying with the technical requirements. Computer equipments whichwill support data reception and processing of hydrometeorological stations, aswell as the run of numerical models and the generation of audiovisual products about weather presentation on the TV are in the process of acquisition.

**Final report comment**

Specialized equipment was procured to measure, process, store and transmit hydro-meteorological information. It consists of 3 satellite receivers, a software licence package for data management in the eastern provinces, 12 portable meteorological stations, a motorized shop equipped with tools, 20 VHF units, 81 RLAN units, and several automatic hydrological stations.
Likewise, computer equipment was procured to support data collection and processing, develop numerical modelling for weather forecasts, and generate audiovisual products for presentation on television.

### Mean ( 2/4 )

**Short description**

Mobile laboratory

| | |
|---|---|
| **Costs** | 60.000,00 € |
| **Intermediate report amount** | 46.256,32 € |
| **Final report committed** | 60.000,00 € |

**Detailed description**

Motor vehicle with the tools and laboratory equipment needed to make it a mobile laboratory.

**Intermediate report comment**

The mobile laboratory and tools for installation, commissioning and subsequent maintenance of the selected stations, were acquired.

**Final report comment**

A mobile laboratory was procured, including the tools required to install, start-up and maintain the meteorological stations

### Mean ( 3/4 )

**Short description**

Services, equipment and furniture

| | |
|---|---|
| **Costs** | 37.000,00 € |
| **Intermediate report amount** | 24.841,10 € |
| **Final report committed** | 37.667,95 € |

**Detailed description**

Acquisition of equipment and furniture, and execution of facilities maintenance at hydro-meteorological stations to ensure proper and safe operation on extreme weather conditions.

**Intermediate report comment**

The contingency modules and the electrical equipment for meteorological stations were acquired.
The furniture is in the process of acquisition.

**Final report comment**

Contingency modules were procured for the hydro-meteorological stations, as were the pieces of furniture necessary to secure their smooth, safe operation over extreme weather events, and the electrical equipment required to support the meteorological stations

**Mean ( 4/4 )**

**Short description**

Travel, DSA, accommodation

| | |
|---|---|
| **Costs** | 15.460,00 € |
| **Intermediate report amount** | 5.500,58 € |
| **Final report committed** | 15.459,99 € |

**Detailed description**

This budget has the purpose of ensuring the missions for the analysis and evaluation of technologies to be acquired and transferred to the country. This includes high-tech equipment such as measuring stations, hardware and communications equipment, etc. Once selected and acquired, the training of national experts needs to be performed. They then replicate the knowledge acquired in each territory. For this, we have planned training local technicians, which also demand mobility and subsistence expenses.
This result also provides support for EWS vulnerability studies. This will ensure the movement of experts and field visits to each measuring station as well as to other facilities of the EWS.

**Intermediate report comment**

The approval process of the RLAN sample concluded at the end of March 2014, therefore, the transfer of this technology to local technicians was postponed for the second quarter 2014, during the field testing period of installation of these equipment at the selected provinces of the project.

Programs currently being prepared to ensure the training of specialists and technicians: wireless communications (GPRS, VHF, WLAN), Weather Stations (Thies, HUATRON, DAVIS), Satellites (GOES LRIT, GEONETCAST, EUMETCAST), Software Applications (TV, Platform) and Joint Interagency Action Procedures (Interaction INRH, INSMET,AMA, DC). Also are also creating conditions of Training Center of INSMET

**Final report comment**

Expenditures related to two international trainings and 1 national training for specialists of INMSET. Also was conducted 1 National training for specialists of INRH

## 4. OPERATIONAL FRAMEWORK

### 4.3.2.2 MORE DETAILED INFORMATION PER RESULT - Result (2)

**Details**

**Result's short description**

A set of procedures and tools for monitoring, analyzing and forecasting hydro-meteorological hazards established

| | |
|---|---|
| **Total amount** | 47.740,00 € |
| **[INT] Total amount** | 4.627,67 € |
| **[FIN] Total amount *** | 47.740,00 € |

**Sector** Disaster Risk Reduction / Disaster Preparedness

**Sub-sectors** Institutional linkages and advocacy

**Number of beneficiaries** 150.400

**Intermediate number of ben.** 150.400

**Final actual number** 150.400

**Status of beneficiaries** IDP ☐ Population ■ Refugees ☐ Returnees ☐ Others ■

**Detailed description**

Defined procedures to standardize the data processing and the interpretation of the analysis and forecasting, to ensure that warning information is used consistently by the different EWS stakeholders.
The tools and procedures developed will be used by staff for monitoring points, data collection and processing centers, emergency management centers, and radio and television broadcasting stations.
The information from the hydro-meteorological services, which at present is only available in their private networks, will be shared by both agencies through the established communication protocols. The shared data will be processed to produce timely forecasts, warnings and other reports made available for the emergency management stakeholders.

**Intermediate report comment**

A first release of the software to show weather forecasting information on TV was presented in the national press by INSMET software developers and specialists. This version contains modules to include data from different sources and software tools to manage these information and make custom presentations by meteorologists; however the configuration modules and the assimilation of data continue to been riched.

Works in the development of procedures and tools are underway. Software structures to be used in the platform have already been defined as a basis for communication and the processing and visualizing of the information in the selected provinces.

It is important to recall the progress obtained in numerical modeling as a basis for making the weather forecast. For the first time in Cuba, information from radar and satellite is being simultaneously assimilated, which directly influences in the quality and accuracy of the forecast.

The software tool for data integration and assimilation of various models of WS is been testing. It continues the joint working between specialists and technicians of INSMET, AMA, CD and INRH for homologating the procedures to ensure the exchange of information between the different actors of EWS.
The processing and analysis equipment that support the exchange platform of software products are in process of acquisition.

**Final report comment**

The comprehensive operational platform required to standardize the data process and to interpret analyses and forecasts was developed. This software tool makes it possible to integrate and assimilate different data forms that are sent by WSs.Under the acquisition data associated with various sources, specialized modules linked with each of these sources were separately developed. The collection and storage software programmes include those associated with automatic and semi-automatic meteorological stations: SISMAT (Annex 8), as well as satellite product acquisition modules, numerical model outputs, and condition of dams and automatic hydrological stations. They are all contained in the Comprehensive Operational Platform for EWS Information Management (Annex 9).These systems have incorporated data management using various sources such as data loggers like HUATRON, THIES, VAISALA, text files (.dat, .txt, .csv), and databases (sql server, mysql). A short-term forecast system was developed to connect numerical weather prediction and data collection models. This system is based on the use of advanced numerical methods to solve equation systems that describe physical processes in the atmosphere and provide the basis for weather forecasts (Annex 6). An inter-institutional data exchange protocol was signed betweenINSMET and INRH to share hydro-meteorological information and outputs. INSMET, INRH, AMA and Civil Defence (CD) have developed a comprehensive operational protocol to exchange data and outputs that provide appropriate information to decision-makers (Annex 5). This procedure is based on a methodological document that clearly establishes coordination between and among various EWS-related actors. Likewise, a protocol has been developed for the integration of a meteorological information satellite reception system. The protocols used to exchange meteorological outputs include FTP (File Transfer Protocol) and HTTP (Hyper Text Transfer Protocol). They are both aimed at managing web-based transactions. Under FTP, all primary outputs that are downloaded by the reception systems and a number of personalized outputs that are useful in detecting storms, forest fires, atmospheric water vapour, etc. are available. Under HTTP, the national web provides a wide range of personalized outputs that are classified per type of variable, type of product, impact area, etc. The downloading, processing and publication of all products available under such communication protocols are fully automated, on the basis of a number of applications that ensure effective management of the meteorological information that is received from stations. Two products were developed to appropriately visualize the information to the population: The first one is a TV software programme for local TV stations in the provinces selected (Annex 10). This is a specialized system for the presentation of weather forecasts on TV, based on daily predictions. Its main function is to show the meteorological information to viewers in high definition and in a manner compatible with digital TV technology (which is being currently introduced in Cuba). Its modular design makes it possible to show various types of information. Using state-of-the-art three-dimensional graphic technology, it provides for a high degree of realism. The methodology is contained in TV forecast manuals and renders the process viewer-friendly. The tools that have been developed also display geo-referenced relief in any region of the world after having entered the relevant data.The second one is an educational spot that aims to increase risk perception in the four EWS phases. This helps the population to be aware of and implement life-saving actions (Annex 24: https://www.dropbox.com/s/8x0q1he33rjvipx/spot.f4v?dl=0 ).

## Objectively verifiable indicators

### Indicator ( 1/4 )

**Short description**

Data acquisition system

**Sources of verification**

-Data completion reports
-Users feedback

**Target value** at least 2 data sources

**Intermediate value** ongoing

**Final value** 3 data sources

**Detailed description**

Defining a data access interface to achieve standardization of acquisition procedures of the different data sources.

**Intermediate report comment**

Actions of INSMET specialists in obtaining interfaces data to access various modules of measuring points continue.

**Final report comment**

1. Dataloggers
2. Text Files
3. Data basesUnder the data acquisition systems associated with various sources, specialized modules linked with each of these sources were separately developed.
The collection and storage software programmes include those associated with automatic and semi-automatic meteorological stations (SISMAT), as well as satellite product acquisition modules, numerical model outputs, and condition of dams and automatic hydrological stations. They are all contained in the Comprehensive Operational Platform for EWS Information Management. These systems have incorporated data management using various sources such as data loggers like HUATRON, THIES, VAISALA, text files (.dat, .txt, .csv), and databases (sql server, mysql).

### Indicator ( 2/4 )

**Short description**

Numerical weather forecast tool

**Sources of verification**

-Forecast effectiveness
-Users feedback
-Field visits
-Interviews

**Target value** one 24 forecast at 3km resolution

**Intermediate value** ongoing

**Final value** one 24 forecast at 3 km resolution

**Detailed description**

Introduction of a tool for numerical weather forecasting at local level increasing the spatial resolution up to 3 km and reducing updating periods up to 6 hours.

**Intermediate report comment**

Testing and assessment of the tool for numerical weather prediction in the selected provinces, which will have updates every 6 hours and up to 1 km spatial resolution, continue.

**Final report comment**

A short-term forecast system was developed to connect numerical weather prediction and data acquisition models. This system is based on the use of advanced numerical methods to solve equation systems that describe physical processes in the atmosphere and provide the basis for weather forecasts (Annex 6). The radar and satellite information that is now being received in Cuba for the first time has a direct impact on forecast quality and effectiveness.

### Indicator ( 3/4 )

**Short description**

Interagency data sharing protocol

**Sources of verification**

-Users feedback
-Field visits
-Interviews
-Traffic logs

**Target value** at least 2 protocols

**Intermediate value** ongoing

**Final value** 2 protocols

**Detailed description**

Definition of protocols to establish the communication between INSMET and INRH to share the hydro-meteorological measured data and products.

**Intermediate report comment**

The INSMET, the INRH, AMA and the CD continue working together in the development of a single protocol for sharing data and products that allow proper communication to decision makers.
This process is supported by the methodological project document, which clearly indicates the coordination between the different actors in the operation of the Early Warning System.

**Final report comment**

An inter-institutional data exchange protocol was signed between INSMET and INRH to share hydro-meteorological information and outputs. INSMET, INRH, AMA and Civil Defence (CD) have developed a comprehensive operational protocol to exchange data and outputs that provide appropriate information to decision-makers.
This procedure is based on a methodological document that clearly establishes coordination between and among various EWS-related actors.
Likewise, a protocol has been developed for the integration of a meteorological information satellite reception system. The protocols used to exchange meteorological outputs include FTP (File Transfer Protocol) and HTTP (Hyper Text Transfer Protocol). They are both aimed at managing web-based transactions. Under FTP, all primary outputs that are downloaded by the reception systems and a number of personalized outputs that are useful in detecting storms, forest fires, atmospheric water vapour, etc. are available. Under HTTP, the national web provides a wide range of personalized outputs classified per type of variable, type of product, impact area, etc. The downloading, processing and publication of all products available under such communication protocols are fully automated, on the basis of a number of applications that ensure effective management of the meteorological information that is received from stations.
All data is made available to involved parties (INSMET, INRH, CD, and AMA) through an electronic information exchange platform developed by INSMET as a part of this project.

**Indicator ( 4/4 )**

**Short description**

Audiovisual product

**Sources of verification**

-Photos and videos of products
-Population interviews
-Field visits

**Target value** at least 2 products

**Intermediate value** ongoing

**Final value** 2 products developed

**Detailed description**

Generation of software products to visualize proper information to the population through the local radio and TV broadcasting stations.

**Intermediate report comment**

Updating of the software developed by INSMET specialists for weather forecast on television in selected provinces continue. This presentation software of the weather on TV is finished; however, the configuration modules and the assimilation of data continue to be enriched.
Regarding this software, it was made visible a first version by INSMET executives in the national press.
Works are also maintained for meteorological applications in real time to show as a news report headband informative in television regular sites.

**Final report comment**

Two products were developed to appropriately visualize the information to the population:
The first one is a TV software programme for local TV stations in the provinces selected. This is a specialized system for the presentation of weather forecasts on TV, based on daily predictions. Its main function is to show the meteorological information to viewers in high definition and in a manner compatible with digital TV technology (which is being currently introduced in Cuba). Its modular design makes it possible to show various types of information. Using state-of-the-art three-dimensional graphic technology, it provides for a high degree of realism. The methodology that is contained in TV forecast manuals renders the process viewer-friendly. The tools that have been developed also display geo-referenced relief in any region of the world after having entered the relevant data.
The second one is an educational spot that aims to increase risk perception in the four EWS phases. This helps the population to be aware of and implement life-saving actions.

## Activities

### Activity ( 1/4 )

**Short description**

Identification and acquisition of equipment and software to strengthen the INSMET development group capabilities

**Start date** 15/06/2013

**End date** 01/02/2014

**Detailed description**

Procurement of specialized equipment and software to improve the INSMET development group capability for the design and implementation of procedures and tools targeted to specialists, decision makers and the population. This enhanced software development capability at INSMET can be utilized by neighboring countries requiring EWS improvement interventions. INSMET is in a position to provide technical services, including software training and transfer.

**Intermediate report comment**

The first version of the presentation software of the weather on TV is close to finalization.

Joint working between specialists and technicians of INSMET, AMA,CD and INRH for homologating procedures to ensure the exchange of information between the different actors of EWS continues.

The processing and analysis equipment that support the exchange platform of software products are in process of acquisition.

**Final report comment**

Computer equipment was procured to support the platform that has been developed to exchange specialized software programmes and products to enhance the work of the INSMET group in charge of designing and implementing tools and procedures for specialists, decision-makers and the general population. Increased capacity in software development at INSMET can be considered a successful experience in improved EWS.
INSMET staff includes high-level specialists who enjoy WMO recognition. They are thus in a position to provide technical services, including software transfer and training.
They have so far developed software packages like the comprehensive operational platform, numerical modelling, integration of meteorological information satellite reception systems for automatic weather monitoring, etc.

### Activity ( 2/4 )

**Short description**

Refurbishing of INSMET development group premises

**Start date** 15/06/2013

**End date** 01/02/2014

**Detailed description**

The refurbished premises of the software development group ensure the protection and proper functioning of the installed equipment and also provide an appropriate working environment for the staff.

**Intermediate report comment**

The INSMET is located in a building that is part ofthe science heritage of the city of Havana; therefore, any intervention in its facilities is monitored by heritage specialists. The facilities of the software development group ensure the protection and proper functioning of the installed equipment and also provide an adequate working environment for the staff.

**Final report comment**

The refurbishing works that have been carried out at the facilities of the INSMET software development group guarantee protection, security and electricity supply for the smooth operation of the equipment that has been installed. These facilities are air-conditioned for equipment protection and provide appropriate working environment. The refurbishing works were painstakingly conducted as the building is part of the historical heritage of science in Cuba.

### Activity ( 3/4 )

**Short description**

Development of the procedures and tools

**Start date** 01/07/2013

**End date** 01/05/2014

**Detailed description**

Design and implementation of acquisition and data validation tools, automatic calculation of variables, automated quality control, alarms generation, data transfer protocols, numerical forecasting at local level, storage in databases, historical statistics and audiovisual products.

**Intermediate report comment**

Works in the development of procedures and tools are underway. Software structures to be used in the platform have already been defined as a basis for communication and the processing and visualizing of the information in the selected provinces.

Works in the development of procedures and tools remain. Software structures to be used in the platform have already been defined as a basis for communication and the processing and visualizing of information in selected provinces.

It is important to recall the progress obtained in numerical modeling as a basis for making the weather forecast. For the first time in Cuba, information from radar and satellite is being simultaneously assimilated, which directly influences in the quality and accuracy of the forecast.

The software tool for data integration and assimilation of various models of WS is been tested.

**Final report comment**

A set of software tools were developed to manage EWS information flows. They are classified as follows: data collection and storage; data transmission and control; and specialized product presentations. The data collection and storage software programmes include SISMAT, satellite product acquisition models, numerical model outputs, condition of dams and automatic hydrological stations under the Comprehensive Operational Platform for EWS Information Management. These systems have incorporated data management using various sources such as data loggers like HUATRON, THIES, VAISALA, text files (.dat, .txt, .csv), and databases (sql server, mysql).
On the other hand, the data transmission systems that have been developed include the use of means of communication that have been strengthened under the project and various communication protocols to control EWS data flows and outputs. These protocols cover https and ftp for inter-agency product management using the platform. Data exchange between and among meteorological stations is conducted under tcp/ip protocols for LAN and WAN connections, as well as via serial port utilizing the rs-232 standard for connections through optical fibre, VHF, and GPRS.
The specialized product presentation systems have to do with mapping, plotting and tabulation of hydrological, meteorological, risk-management and decision-making-related information. Other dedicated modules that have been incorporated into the software packages that have been developed include those linked with automatic warning and report generation. These packages are used for applications such as SISMAT (meteorological station product presentations), METTV3 (TV weather forecasts), weather-forecast-related numerical model outputs, and the platform (integrated EWS product presentations).
Likewise, a protocol has been developed for the integration of a meteorological information satellite reception system. The protocols that are used to exchange meteorological outputs include FTP (File Transfer Protocol) and HTTP (Hyper Text Transfer Protocol). They are both aimed at managing web-based transactions. Under FTP, all primary outputs that are downloaded by the reception systems and a number of personalized outputs that are useful in detecting storms, forest fires, atmospheric water vapour, etc. are available. Under HTTP, the national web provides a wide range of personalized outputs classified per type of variable, type of product, impact area, etc. The downloading, processing and publication of all products available under such communication protocols are fully automated, on the basis of a number of applications that ensure effective management of the meteorological information that is received from stations.
Another methodological proposal has to do with the automated hydrological modelling that has been developed by INRH to predict overflows in real time. Once it gets implemented, it will remove current limitations in estimating surface flows and hydraulic system performance over extreme events

**Activity ( 4/4 )**

**Short description**

Technology transfer to national experts on the management of the EWS software components, and their subsequent use and interpretation for the development of procedures and tools

**Start date** 15/06/2013

**End date** 01/04/2014

**Detailed description**

The transfer of technology for the installation, configuration and development of EWS software components to national experts. The appropriate use of this new technology will increase the reliability and accuracy of the measurements of the variables to ensure hydro-meteorological forecasts.

**Intermediate report comment**

The approval process of RLAN was concluded at the end of March, so the transfer of this technology to local technicians will be in the second quarter during field tests selected provinces in the project. At the moment is in restoration the center of INSMET training, guarantee the training of specialists and technicians in Software Applications in wireless communications, satellites, TV, Platform and Joint Interagency Action Procedures (Interaction INRH, INSMET, AMA, DC )

**Final report comment**

The updating of national experts and technology transfer on EWS-related software component management for further use and interpretation provide the basis for the development of procedures and tools under the project.
The modality that has been used for this purpose has had a great impact on several stages, including assembling equipment and applying relevant software programmes, as well as holding provincial workshops to discuss tool-facilitated services for strengthened meteorological surveillance:
" Processing satellite information,
" Interpreting numerical models, and
" Using the computer-based platform to exchange data and support EWS operation.
Technology transfer for cordless communication equipment operation and maintenance guarantees service provision over extreme hydro-meteorological events.
It was recognized that the equipment that has been installed and the tools that have been developed help to strengthen the capacities of the Meteorological Centre and the Provincial Hydrological Services to monitor extreme events.
Another training action included the installation of computer servers for DemasDB, DemasVis, and DemasOLE applications seeking to collect, store, process and edit the data that are sent by automatic stations, as well as the SEBA HydroCentre tool, which provides a web-based platform for measurement data. It is customized to meet the needs of INRH and its local units. It also provides easy access to and downloads measurement data at automatic stations by way of hydrographs and lists (tables).
The training actions also covered the configuration and start-up of other computer applications, as well as station testing. They laid the foundations for the incorporation of the data that are collected and transmitted by other automatic stations at other watersheds like that of the Zaza River and the hydrometric training site at the Hanábana Watershed into the system. The data from special information networks (785 rain-gauge stations and 242 dams) were also incorporated. They are measured using conventional methods and are tele-transmitted every 24 hours under normal conditions and every 8, 4 and 2 hours under extreme events

## Means and costs

### Mean ( 1/3 )

**Short description**

| | | |
|---|---|---|
| Computing and networking equipment | **Costs** | 23.200,00 € |
| | **Intermediate report amount** | 0,00 € |
| | **Final report committed** | 23.200,00 € |

**Detailed description**

The high performance networking and computing equipment providing support functions for the overall management processing and diffusion of hydro-meteorological data and products includes components to ensure inter-agency coordination.

**Intermediate report comment**

Processing and analysis equipment that support the exchange platform of software products are in process of acquisition.

**Final report comment**

State-of-the-art computer equipment was installed to support hydro-meteorological data and product management and dissemination networks, especially processing and analysis under the comprehensive operational platform that ensures inter-agency coordination.

### Mean ( 2/3 )

**Short description**

| | | |
|---|---|---|
| Material, components and furniture for refurbishing premises | **Costs** | 15.220,00 € |
| | **Intermediate report amount** | 3.140,56 € |
| | **Final report committed** | 15.220,03 € |

**Detailed description**

Equipment, facilities and furniture will be refurbished and the premises will be refurbished to ensure proper and safe operation of the high performance computing equipment associated to the INSMET development group.

**Intermediate report comment**

In restoration process the facilities of the group of development of INSMET

**Final report comment**

The work areas for the INSMET development group were refurbished to guarantee the safe operation of the equipment that has been installed. The furniture at these facilities was also replaced.
This group has developed several protocols under the project, including the comprehensive operational platform, the integration of meteorological information satellite reception systems, and automatic weather monitoring.

### Mean ( 3/3 )

**Short description**

| | | |
|---|---|---|
| Travel, DSA, accommodation | **Costs** | 9.320,00 € |
| | **Intermediate report amount** | 1.487,11 € |
| | **Final report committed** | 9.319,97 € |

**Detailed description**

This budget has the purpose of ensuring the missions for the analysis and evaluation of technologies to be acquired and transferred to the country. This includes high-tech equipment for developing, hosting and setup of software tools. Once selected and acquired, we must perform the training of national experts. They then replicate the knowledge acquired in each territory. For this, we have planned training local technicians, which also demand mobility and subsistence expenses.

**Intermediate report comment**

The approval process sample RLAN conclude at the end of March 2014, so the transfer of this technology to local technicians will be the second quarter 2014, during field tests on the selected provinces.

**Final report comment**

Field missions were organized to review and assess the technologies under application. Communication equipment coverage tests played a vital role in securing the right location for every piece of equipment, including RLAN, VHF units,
GPRS, and optical fibre.
The location of hydrological stations for dam monitoring and control was also analyzed.
Local technicians and specialists were trained on high-technology equipment operation and maintenance, and software tools configuration.

## 4. OPERATIONAL FRAMEWORK

## 4.3.2.2 MORE DETAILED INFORMATION PER RESULT - Result (3)

### Details

**Result's short description**

The capacity of local stakeholders, including at the community level, to manage new EWS technologies and perceive risks is strengthened, facilitating access and communication in disaster situations

| | |
|---|---|
| **Total amount** | 104.007,00 € |
| **[INT] Total amount** | 17.200,70 € |
| **[FIN] Total amount *** | 111.252,73 € |

| | |
|---|---|
| **Sector** | Disaster Risk Reduction / Disaster Preparedness |
| **Sub-sectors** | Information, education, communication |

| | |
|---|---|
| **Number of beneficiaries** | 416 |
| **Intermediate number of ben.** | 416 |
| **Final actual number** | 416 |
| **Status of beneficiaries** | IDP ☐ Population ■ Refugees ☐ Returnees ☐ Others ■ |

**Detailed description**

The number of beneficiaries includes 100 specialists, 110 decision makers, 156 community representatives, 30 AMA representatives and 20 foreign experts.

Local capacities will be strengthened with new EWS technologies to better deal with disaster situations and reduce the risk of life and economic loss. This knowledge management experience is a pilot project in the country, seeking to highlight the need for EWS integration and timely access to information issued by local authorities. It is also a pilot project decentralizing the management of EWS information to the local level and relying on the network of RRMC at the provincial and municipal levels in eastern Cuba.

The project plans to organize:

- National workshops to disseminate the results of the experience and promote EWS coordination at the local level, and to share the lessons learned, especially under DIPECHO projects coordinated by CARE, OXFAM and the International Red Cross, as well as to facilitate the exchange at region level through the regional space as CDEMA and Caribbean Risk Management Initiative (CRMI).
- National and local workshops to prepare the implementation of activities identified.

In relation to "Risk identification", community members, local stakeholders and decision-makers will be able to identify risks better thanks to the exchange of updated HVRS, that seek to raise risk perception and appropriately respond to alerts and warnings. It will take into account the expertise of UN Habitat to facilitate trainings using participatory techniques, as Agenda 21. This process of knowledge management to facilitate decision making includes:

- Local government decision-makers trainings to manage the information obtained from risk analyses and forecasts.
- RRMC, EWP specialists and multidisciplinary group trainings to formulate communication, warning and alert proposals for decision-makers, based on updated HVRS.
- Respect to "Local responsiveness to warnings": exchanges and systematization at eastern provinces of successful lessons from

other province of the country.

It will also promote exchanges on the role of women in DRR, and specifically early warning processes.

Other actions, include promotion, systematization and publication of lessons and experiences gained in the project.

The project experience can be replicated in other provinces of Cuba and in other countries encouraging the technical participation of Cuban authorities in events of CDEMA, such as the annual Comprehensive Disaster Management (CDM) Conference, in collaboration with CRMI. Cuba will participate in the event by sharing the experience and the developments in EWS in the RRMC model.
The coordination with UNDP and UNISDR in the region will include the following aspects:

- Link experts and stakeholders identified by ISRD at the regional level with the topics covered by the DIPECHO project in Cuba in connection with the role of EWSs.
- Promote the participation of ISRD experts and stakeholders in exchange forums promoted under the project.
- Cuba's participation in the UNDP regional project entitled CRMI, which seeks to replicate the experience of the Cuban RRMCs in the Caribbean.
- Cuba's participation in exchange forums organized by UNDP at the global and regional levels, within the framework of ISRD.
- UNDP Cuba active participation in the UNDP community of practice on risk management at the regional level.
- The UNDP Regional Center in Panama will promote the visibility of this project's results in its communities at local level, and identify the countries of the region that could benefit from bilateral exchanges on the experience gained by Cuba under the project.

**Intermediate report comment**

The documentation to present the project and the results achieved so far in UNISDR Platform is being prepared. This presentation will be held in Quito, Ecuador,in May, 27th to 29 th and will show the results of the project related to the system of meteorological and hydrological monitoring by strengthening a network of stations that will catch and process data required to ensure constant monitoring of hydrometeorological events and significance in the assessment of risk studies of hazards, vulnerability and risk (HVRS) to facilitate decision-making by local authorities.

Important aspect has been continuity during this period of work with the CD. It has funded the design and printing of 1000 copies of the No.1 of Magazine of CivilDefense in the 2014. The publication highlights relevant news closely relatedto the United Nations System (page 48), as was the visit to the National Headquarters of the Civil Defense of the Secretary General of the United Nations, Mr. BanKi-Moon and workshops projects financed and supported by UNDP Risk; including Risk Reduction Workshop in Cuba: Gender approach, training and technical decision-makers Caribbean held in the context of the Initiative Project RiskManagement in the Caribbean (CRMI) and the International Workshop on Urban Resilience where experiences were shared in the context of South-South cooperation.

Onpage 12 of the popular exercise activities, community preparedness and disaster prevention is explained. Page 62 shows the Early Warning System (EWS) for tropical cyclones in Cuba since forecast. Very significant is the article "Early Warning Systems: pillars in disaster risk reduction" (page 56) which explains the components of a SAT and the considerations that led to thisproject raised under the Action Plan for the Caribbean Disaster Preparedness Program of Humanitarian Aid Department of the European Commission (DIPECHO), objectives and expected results . Along with the given to the project, the project declares a commitment to strengthen the EWS in Cuba and share these practices in the region and other countries.

In February 2014 the meeting was held to discuss the outcome of HRVs performed in selected provinces.

Other action has been the preparation for Exercise Meteoro in coming weeks will beheld throughout the country and is an activity to support this project.

Currently, the most important actions are in the development of procedures and methodologies then shared with decision makers and authorities.

**Final report comment**

Knowledge management for national and local capacities has been strengthened to better cope with disaster situations and reduce the risk of human and economic losses. The project has highlighted the importance of integration between and among EWS-related institutions. It has also become a pilot experience for decentralized information management at the local level in the provinces selected. In this regard, 100 hydro-meteorological EWS specialists, including 40 national experts, were trained on new technologies. The RLAN technology that has been introduced provides one of the best choices for cordless communication systems Local specialists were trained in this technology in provinces selected. Training was also provided for the correct use and operation of satellite receivers and the provision of hydro-meteorological services in real time to EWS users. Applying the Agenda 21 methodology, the UN-Habitat workshops were aimed at assessing and enhancing risk perception and preparedness of the population and the institutions to deal with extreme hydro-meteorological events at the local level. A National Workshop on Gender and Risk Reduction was organized to discuss key issues such as the active role of women in risk reduction management processes. Likewise, a Workshop on the Role of the Mass Media in Hydro-Meteorological EWS was attended by relevant institutions and media representatives in the four provinces covered, including TV, radio, and ham operators. The idea was to exchange views on main project results and review proposals to increase the effectiveness of public message dissemination processes over extreme hydro-meteorological events. The Final Project Workshops provided an excellent framework to socialize the main results that were obtained by key provincial EWS actors and lessons learned. The project contributions included developing a comprehensive operational procedure for hydro-meteorological and hazard forecasts, supplying equipment, helping to develop tools to enhance capacities, building and maximizing all these developments to disaster reduction plans, considering the magnitude of events and local characteristics. The AMA Training Centre was also strengthened for DRR. It also facilitates the exchange with other Caribbean countries under the Caribbean Risk Management Initiative (CRMI). Considering the characteristics and technical specifications of acquired equipment, the project supported the training of a procurement specialist for the UNDP to certify these technology acquisitions for the project. The project results were presented at the 9th International Congress on Disasters, which was held in Havana in June 2014. Were also presented in other regional events in correspondence with the objectives and results, both the project and the EU and UNDP:
- Regional Meeting of ECHO Partners in Santo Domingo in October 2013. Held within the framework of the 2013-2014 DIPECHO Action Plan for the Caribbean
- Meeting on the Regional Platform for DRR in the Americas, Guayaquil (Ecuador), in May 2014. -Regional Meeting of ECHO

Partners in Montego Bay (Jamaica) in October 2014
-Regional Workshop on Planning for Adaptation to Climate Change, held in Santa Cruz, Bolivia in November 2014. At this meeting were presented the experiences of the project by an official of INSMET We clarify part of the co-financing of UNDP was through own funds that do not charge GMS (indirect cost), as such 6.640.44 € planned for GMS costs were put to disposition of the project (programed under direct costs), specifically in Other Costs: Publications design, edition & printing of materials. This does not affect the fulfillment of the objectives and results of the project.

## Objectively verifiable indicators

### Indicator ( 1/3 )

**Short description**

Number of specialists trained

**Sources of verification**

Participant register
Training programme
Images
Compilation of presentations

| | |
|---|---|
| **Target value** | 100 specialists |
| **Intermediate value** | ongoing |
| **Final value** | 100 specialists trained |

**Detailed description**

Technical training is intended for 100 specialists, including 40 national experts. This training will be replicated for the INSMET specialists, at the local level, specialized in EWS and software use, to promote the integration of the hydro-meteorological EWS and dissemination of weather forecasting on local television. These will be high-level specialists who, once trained, will be able to replicate the knowledge in other regions. They are responsible for selecting, checking, acquire and transfer the new technologies and media to local level. This also includes installation support, commissioning and verification of equipment and software.

**Intermediate report comment**

Coordination has been electronical and not in person. The major actions are in the development of procedures and methodologies that will later be shared with decision makers and authorities

**Final report comment**

One hundred hydro-meteorological EWS specialists, including 40 national experts, were trained on new technologies during the implementation of the project (See Annex 22). The RLAN technology that has been introduced provides one of the best choices for cordless communication systems due to its great resistance to extreme weather conditions, versatility of configurations, scalability in solutions, new application of integrated systems for improved performance, among many other features that turn it into an elite technology on a world scale. Local specialists were trained on this technology to connect all the nodes involved in the EWS information transmission network in the provinces selected. Such nodes belong to various local institutions that participate in the process of measurement, processing, decision-making and TV presentation of EWS hydro-meteorological warnings, which now have a direct communication link. This technology also provides major communication support to connect INRH with INSMET, thereby helping to establish a network for information exchange at the institutional level and improve the quality of hydro-meteorological services.
Training was also provided for the correct use and operation of satellite receivers and the provision of hydro-meteorological services in real time to EWS users. The topics that were discussed at these training actions included hardware components maintenance, operation and upgrading, as well as service configurations for forecast numerical models, climate studies, multivariable monitoring, and detection of severe storms.
These actions were replicated at the local level and covered the installation, start-up, maintenance and upgrading of means and equipment and the use of software packages to promote the integration of hydro-meteorological and other hazard EWSs and the presentation of weather forecasts on local television.

### Indicator ( 2/3 )

**Short description**

Number of decision-makers and community representatives trained

**Sources of verification**

Field visits
Reports
Interviews
Photos
Training lists
Certificates

| | |
|---|---|
| **Target value** | 266 people |
| **Intermediate value** | ongoing |
| **Final value** | 266 people |

**Detailed description**

An estimated 110 decision-makers will be trained as well as 156 representatives of vulnerable communities with EWP coverage (156). These stakeho
These stakeholders play a key role in the components: risk analysis and forecast, communication or dissemination of warnings and alerts and local responsiveness to warnings.

**Intermediate report comment**

At this moment in the implementation of the project, the major actions are in the development of procedures and methodologies that will later be shared with decision makers and authorities.

**Final report comment**

Training was provided to 110 decision-makers and 156 representatives of vulnerable communities under poor meteorological coverage (Annex 23). The focus was on risk perception, decision-making, the comprehensive operational procedure for joint action by all EWS-related institutions, as well as their roles and responsibilities.
Emphasis was also made on mapping, plotting and tabulation of hydrological, meteorological, risk-management and decision-making-related information, depending on the magnitude and characteristics of events.
Community representatives and decision-makers play a key role in the following components: risk analysis and forecast, and communication or dissemination of local warnings, notices, procedures and responses.
Educational materials and methodologies related to the tools and procedures that have been developed were shared.
A Workshop on the Role of the Mass Media in Preparedness and Response was successfully held in Santiago de Cuba under the project. There was a fruitful exchange of views with media representatives on project results and contribution to strengthen the hydro-meteorological EWS, highlighting their importance in all EWS stages, especially in Public Warnings, and to disseminate information on the comprehensive operational procedure.
The software that was developed to present hydro-meteorological forecasts on local television was also presented to the media.
Alternative media, including ham operators, were recognized. They play a vital role in population warnings at the local/community level, on disaster situations, mainly on hydro-meteorological events.
The workshop provided an excellent framework to show the experience that has been gained by the media in the provinces covered and to announce follow-up actions, such as updating the Disaster Reduction Communication Programme in Cuba, incorporating HVRSs and other studies into it, and training journalists along these lines, including the provision of information on population risk perception.

**Indicator ( 3/3 )**

**Short description**

Number of events seeking to exchange experiences and promote their replication at the international and national levels

**Sources of verification**

Field visits
Reports
Interviews
Photos
Training lists
Certificates

| | |
|---|---|
| **Target value** | at least 3 actions |
| **Intermediate value** | ongoing |
| **Final value** | 4 actions |

**Detailed description**

It is estimated that there will be at least 3 events with an average of 50 participants per event. This includes spaces to share lessons learned with national and Caribbean actors and ECHO partners.

**Intermediate report comment**

In the period that is reported they have not had regional meetings of ECHO. The documentation to present the project and the results achieved so far in UNISDR Platform is being prepared. This event will be held in Quito, Ecuador, next May, 27th to 29th.

They have also been planned during the execution of the project the participation in the International Congress of the Cuban Civil Defense in June and in the regional meeting of CEDEMA of December, both in the 2014

**Final report comment**

Presentations at Regional Meetings of ECHO Partners
" Regional Meeting of ECHO Partners in Santo Domingo in October 2013. Held within the framework of the 2013-2014 DIPECHO Action Plan for the Caribbean, this event promoted further collaboration and coordination between and among partners. In this context, common results were appropriately programmed and good practices were harmonized. It focused on improving DRR information and dissemination in the area through the exchange of ideas as to how DIPECHO projects help communities at risk to anticipate, resist, adapt and, occasionally, quickly recover from disasters.
" Meeting on the Regional Platform for DRR in the Americas, held in Guayaquil (Ecuador) in May 2014. It provided an ideal framework to present the Project results in the preparedness phase and highlight the need to invest on DRR to preserve development gains.
" Regional Meeting of ECHO Partners in Montego Bay (Jamaica) in October 2014. This event made it possible to show the project alignment with the Country Document and the Regional DRR Strategy. It also made it possible to establish synergies with other DRR initiatives under South-South Cooperation.
" The project results were presented at the 9th International Congress on Disasters, which was held in Havana in June 2014.

## Activities

### Activity ( 1/5 )

**Short description**

Workshop on project preparation and implementation

**Start date** 15/06/2013

**End date** 01/07/2013

**Detailed description**

National workshop on the preparation and implementation of projects to facilitate links between local actors from different provinces, between the INSMET and INRH, between EWS and local governments as well as between national and local levels with the participation of DRR specialists from UNDP. The project implementation schedule is guaranteed with local stakeholders in each province working under a coordinated work plan specific to each region.
Similarly, they will share the lessons learned after Hurricane Sandy in the eastern region and lessons from other regions of the country that have also been affected by large events. For example, the experiences of Pinar del Rio province, in relation to massive evacuation processes of people, animals, and economic ressources, as well as alternative solutions to evacuation as safe house or rigid cores (room reinforcement).

**Intermediate report comment**

It was executed and reported last year

**Final report comment**

The Initial Workshop was held in the 4 provinces selected: Las Tunas, Holguin; Granma y Santiago de Cuba from 15 to 22 of September 2013. It was attended by EWS-related institutions at the national level (EMNDC, INSMET, INRH, AMA) and their local bodies (DRRCs, UMA, PMCs, Civil Defence, Hydraulic Resources Departments). It provided the framework to present a concept note/educational paper containing guidelines for local authorities over the proposal of a new EWS structure integrating hydrology, meteorology and hazard, as well as the actors who make up this system.
It was also attended by UNDP DRR specialists. All participants reviewed the project implementation with local actors in each province, in line with specific HVRSs.
National authorities shared the lessons learned after the impact of hurricane Sandy in eastern Cuba with local leaders and specialists, and made a comparison between them and those learned in other regions of the country that have also been affected by extreme hydro-meteorological events.

### Activity ( 2/5 )

**Short description**

Update of the HVRS with the support of a Training Center for DRR in the selected provinces

**Start date** 01/09/2014

**End date** 01/10/2014

**Detailed description**

This Training Center for DRR will facilitate several workshops (analysis/assessments/works) in the east, covering issues pertinent to the project. The Center will target the AMA and facilitate the creation of a dossier of materials to be used in other trainings by the AMA. It will also allow the sharing of training materials with the Caribbean countries in the context of the project or the CRMI. In this way, the project seeks to support the EWS and ensure greater efficiency in decision-making during the response to a hazard.
A training is planned on the use of the HVRS as an instrument of the EWS. Is planned too a simulation of the operation of the EWS during "Meteoro 2014".

**Intermediate report comment**

February 2014 a meeting of specialists AMA was performed at the completion of the final document of the HVRS

**Final report comment**

The supply of equipment and furniture to the AMA Training Centre in Holguín province guarantees the preparation and updating of HVRSs. This institution covers the entire eastern region and trains specialists, local authorities, community leaders and Civil Defence representatives in disaster prevention and coping. It also facilitates South-South cooperation and exchange with other countries of the region under CRMI, specifically with technicians and specialists who have been involved in research into hazards, vulnerabilities and risks. Led by the AMA Risk Assessment Group, the Centre has a plan broken down by topic and target group, and seeks to follow-up risk reduction management efforts in Cuba and the region

### Activity ( 3/5 )

**Short description**

Population surveys to validate HVRS as a key component of EWS processes

**Start date** 01/07/2014

**End date** 01/08/2014

**Detailed description**

The strengthening of local capacities in the transfer of experience with Agenda 21 in the cities of Holguin (third largest city in the country) and Bayamo, with diagnostic mapping, community participation, GIS and RRMC. This will allow greater commitment and knowledge of EWS in the community, including local stakeholders need to be aware of the role of EWS and what is expected by the population.
This will be an opportunity to exchange directly with the community, influence their perception of the risks and share experiences of other regions of the country.

**Intermediate report comment**

This activity is planned for next months of June-July 2014

**Final report comment**

Applying the Agenda 21 methodology, the UN-Habitat workshops were aimed at assessing and enhancing risk perception and preparedness of the population and the institutions to deal with extreme hydro-meteorological events at the local level. Four communities were involved in the review of potential event scenarios and strategic implementation of AMA-established procedures and methodological approach for information collection under evaluation/consolidation and risk perception/ preparedness processes to cope with extreme hydro-meteorological events on a local scale.
These events provided an opportunity to hold a direct exchange with the population, learn of its risk perception, and devise ways to increase it.
They made it possible to further apply a transdisciplinary approach that was developed by local governments and institutions, encourage community participation in decision-making, update knowledge, and maximize the use of local risk management tools, especially HVRSs.
They also provided an excellent framework for community leaders and government representatives to acquire knowledge and develop skills for comprehensive hydro-meteorological hazard and risk management, applying active methods, tools and procedures in a participatory manner.
They highlighted the utmost importance that is attached to risk perception and preparedness of the population for the identification of social vulnerability, considering that it has a cross-cutting function vis-à-vis other vulnerabilities.

**Activity ( 4/5 )**

**Short description**

Participation in regional meetings and events organized by DIPECHO and others South-South cooperation meetings related to the project results

**Start date** 15/06/2013

**End date** 01/10/2014

**Detailed description**

Participation in regional meetings and exchanges of knowledge organized by DIPECHO and other regional and global partners, to exchange with their projects in the Caribbean region and other international events related to the project results, include:
- Of particular relevance is the coordination of actions with DIPECHO partners in Cuba and the region, the coordination with the UNDP Regional Center and the regional project CRMI, the links to the UNISRD and CDEMA, etc **.** In this respect, the project will:
- Promote participation in technical exchanges CDEMA organized in Cuba as part of the project, besides the participation of Cuba in similar meetings organized by CDEMA, especially those related to the role of the EWS and its relation to the RRMC and activities SSC developed by Cuba under the UNDP regional project (CRMI).
- The project will collaborate with regional ISDR to:
- coordinate the exchange of experts and stakeholders identified by ISDR regional level with the topics covered by the DIPECHO project in Cuba in relation to the role of the EWS in the prevention and coordination with management of risk reduction tools.
- Share the results of the project in consultation MAH on the contribution of EWS for achieving HFA Objective 2 (Identify, assess and monitor disaster risks and enhance early warning).

**Intermediate report comment**

In the period that is reported they have not had regional meetings of ECHO. The documentation to present the project and the results achieved so far in UNISDR Platform is being prepared. This event will be held in Quito, Ecuador, next May, 27th to 29th.

They have also been planned during the execution of the project the participation in the International Congress of the Cuban Civil Defense in June and in the regional meeting of CEDEMA of December, both in the 2014

**Final report comment**

Presentations at Regional Meetings of ECHO Partners
1. Regional Meeting of ECHO Partners in Santo Domingo in October 2013. Held within the framework of the 2013-2014 DIPECHO Action Plan for the Caribbean, this event promoted further collaboration and coordination between and among partners. In this context, common results were appropriately programmed and good practices were harmonized. It focused on improving DRR information and dissemination in the area through the exchange of ideas as to how DIPECHO projects help communities at risk to anticipate, resist, adapt and, occasionally, quickly recover from disasters.
2. Meeting on the Regional Platform for DRR in the Americas, held in Guayaquil (Ecuador) in May 2014. It provided an ideal framework to present the Project results in the preparedness phase and highlight the need to invest on DRR to preserve development gains.
3. Regional Meeting of ECHO Partners in Montego Bay (Jamaica) in October 2014. This event made it possible to show the project alignment with the Country Document and the Regional DRR Strategy. It also made it possible to establish synergies with other DRR initiatives under South-South Cooperation.
4. Regional Workshop on Planning for Adaptation to Climate Change, held in Santa Cruz, Bolivia in November 2014. At this meeting were presented the experiences of the project by an official of INSMET

**Activity ( 5/5 )**

**Short description**

Workshops to share experiences and lessons learned that will serve as input to the final document/publication on the project experience and its coordination process at the local level

**Start date** 15/06/2014

**End date** 01/10/2014

**Detailed description**

The project will organize workshops to share experiences and lessons learned that will serve as input to the final document/publication on the project experience and its coordination process at the local level.
The publication will be a systematization of the experiences of the EWS and coordination processes at the local level. It will take into account the exchange of experience with other provinces of the country and South-South cooperation. This knowledge product will be disseminated through the mechanisms established by UNISRD and UNDP regional level.
Moreover, would be address the issue of "Women in Cuba and DRR: a view from a gender perspective" will be organized in the framework of the Project for the purpose of sharing lessons about the role of women in the decision making mechanisms and technical working in the EWS. This analysis will be organized by the Federation of Cuban Women (FMC), the EMNDC and with the participation of specialists from DRR, women decision-makers at local level.
In the framework of activities of the 9th International Congress of the CD (June 2014) the results achieved in the framework of the project until that moment will be presented.

**Intermediate report comment**

The project is in implementation. The workshop of lessons learned is planned in the work plan of the project for December of 2014.

**Final report comment**

The Final Project Workshops were held to promote an exchange of views on the main results that were obtained by key EWS-related actors at the national and provincial levels. Lessons learned and good practices were presented. The project contributions mainly covered the development of a comprehensive operational procedure for hydro-meteorological and hazard forecast, which integrates the supply of equipment, tools and methodologies to enhance both national and provincial capacities, as well as the EWS data exchange platform. The procedure is being considered by CD for inclusion in the country DRR methodology, taking into account that it is comprehensive, promotes coordination between and among key EWS-related actors, and makes appropriate use of available information.
The importance of updating HVRSs and incorporating them into the general land and urban management plans was highlighted by workshop participants. They agreed on the need to build upon all these processes to improve disaster reduction plans, considering the magnitude of events and local characteristics.
The tools and procedures that have been developed under the project can well be replicated at other EWS-related institutions in other provinces of the country.
Participants also recognized the need to update the communication strategy for disaster situations, which has been under implementation for eight years, considering the current context of disasters, the impact of climate change, and developments in the operation of the mass media. This is a direct follow-up action by CD.
They also reviewed the impact of presenting the project results at different implementation stages, at national and regional meetings, through South-South cooperation and UNISRD:
" National Workshop "Women and DRR in Cuba: A review from the gender perspective," organized in December 2013 to deal with the role of women in EWS-related decision-making and technical mechanisms.
" 9th International Congress of CD, held in June 2014 to advance project results and impact on DRR.
Project systematization, including EWS experiences and coordination at the local level, as well as the actions that have been further implemented by national and local counterparts. This document has been published on the UNDP-Cuba website Annex 16: http://www.cu.undp.org/content/cuba/es/home/library/crisis_prevention_and_recovery/librosat.html)
Another product of great importance to share the results and experiences of the project has been the multimedia published in UNDP page (Annex25: http://goo.gl/vtWFii)

## Means and costs

### Mean ( 1/4 )

**Short description**

Travel, DSA, accommodation

| | |
|---|---|
| **Costs** | 36.117,00 € |
| **Intermediate report amount** | 10.208,56 € |
| **Final report committed** | 41.677,52 € |

**Detailed description**

Note that this is a result focused on knowledge management and training. This mainly includes workshops and training locally and regionally. These have been set at the level of the detailed descriptions of the activities and result.

**Intermediate report comment**

In this reporting period the expenses correspond to AMA meeting February 2014

**Final report comment**

The expenditures has focused on developing knowledge management and training; mainly on workshops at the regional and local levels.

### Mean ( 2/4 )

**Short description**

Publication the relationship between EWS, local level process and reduction risk

| | |
|---|---|
| **Costs** | 16.080,00 € |
| **Intermediate report amount** | 585,99 € |
| **Final report committed** | 25.821,88 € |

**Detailed description**

Publication on the project experience and its co-ordination process at the local level. This include design, editing and printing.

**Intermediate report comment**

Ongoing

**Final report comment**

Publication of the project systematization and other materials that show the relationship between EWS and DRR at the local level. slightly higher amount was spent on mean no 2, due to savings made on the mean no 4 "equipment and furniture",

### Mean ( 3/4 )

**Short description**

Expendable materials

| | |
|---|---|
| **Costs** | 7.140,00 € |
| **Intermediate report amount** | 2.434,57 € |
| **Final report committed** | 6.760,75 € |

**Detailed description**

Expendable materials for the publication of this experience and the dissemination of knowledge on appropriate strategies to recover from extreme natural events and reduction of risks and vulnerabilities.

**Intermediate report comment**

Ongoing

**Final report comment**

It has to do with expendable materials for disseminating knowledge about risk and vulnerability reduction methodologies and tools. Increase for balances of equipment and furniture

**Mean ( 4/4 )**

**Short description**

| | | |
|---|---|---|
| Equipment and furniture | **Costs** | 44.670,00 € |
| | **Intermediate report amount** | 3.971,58 € |
| | **Final report committed** | 36.992,58 € |

**Detailed description**

Equipment and furniture for the training premises.

**Intermediate report comment**

In the process of acquisition.

**Final report comment**

Equipment and furniture were procured for DRR training sites. By the international market fluctuation costs for this medium were lower than planned. The balance was implemented in the management of knowledge planned in this same result

### 4.3.3 Other costs

| Description | Initial Amount | Revised Budget | Intermediate report amount | Final Committed |
|---|---|---|---|---|
| institutional visibility/communication Visibilité institutionnelle/communication | 2.990,00 € | 2.990,00 € | 197,77 € | 2.990,05 € |
| Travel, DSA accommodation for monitoring | 11.310,00 € | 11.310,00 € | 1.004,99 € | 11.422,04 € |
| Service contracts | 35.260,00 € | 35.260,00 € | 35.260,00 € | 35.147,91 € |
| Transport equipment | 24.980,00 € | 24.980,00 € | 22.457,30 € | 24.003,51 € |
| Transportation services | 8.950,00 € | 8.950,00 € | 5.289,04 € | 9.926,49 € |
| **Total other costs :** | 83.490,00 € | 83.490,00 € | 64.209,10 € | **83.490,00 €** |

## 4.4 Workplan

### 4.4 Workplan

| Activities | 2013 | | | | | | | 2014 | | | | | | | | | | | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6 (1/2) | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 |
| Identify and acquisition of equipment | | x | x | x | x | x | x | x | | | | | | | | | | | | |
| Installation of the equipment | | | | x | x | x | x | x | x | x | x | | | | | | | | | |
| Software development | x | x | x | | | | x | x | | | | | | | | | | | | |
| Training: specialists, decision makers and community | x | x | | | x | x | x | | | x | x | | x | x | | | x | x | | |
| Improve networking: monitoring, analysis, alerting, response | | | | x | x | x | x | x | x | x | x | x | x | | | | | | | |
| Testing and simulation | | | | | | x | x | | | x | x | | x | x | | | x | | | |
| Monitoring | x | | x | | x | | x | | | x | | | x | | x | | x | | x | |
| Systematize and socialize lessons | | | x | | | | x | | | | | | | | | | x | x | x | |
| Report | | | | | | x | x | | | | | | | | | | | x | x | |
| Final Report | | | | | | | | | | | | | | | | | | | | x |

A more detailed version will be provided in the early stage of the operation

### 4.4.1 [INT] Revised work plan, if changed after proposal

Please see Annex 10.

### 4.4.2 [FIN] Report if major changes compared to original planning

No changes

## 4.5 Monitoring, evaluation, audit and other studies

### 4.5.1 Monitoring of activities (explain how, by whom)

The monitoring will be carried out according to UNDP standard policies and procedures. It will be undertaken by UNDP in partnership with the INSMET and will be ensured through the following:

1- UNDP will monitor substantive as well as administrative aspects of the Action framework in order to assure the achievement of the proposed objective within the expected time frame and with the planned resources. UNDP has a dedicated team that will be responsible for coordinating the project. This team has been strengthened by taking into account the demand in DRR area. It consists of qualified personnel that will be responsible for monitoring the results, procurement process, knowledge management and project visibility.
2- UNDP has established an exchange mechanism with the authorities of the territories (at municipal and provincial level). Another effective mechanism of interaction will be through the link between the INSMET and Provincial Meteorological Centers (PMC).
3- It is planned to organize a Coordination and Monitoring Committee of the project formed by the MINCEX, INSMET, AMA, INRH, Local Governments, provincial administration and UNDP, with the participation of Civil Defense.
4- Quarterly monitoring visits have been identified in the workplan. These visits involved the institutions described above. During the visits, workshops will be made with all the institutions and actors involved in the project. The visits will be made at the level of each province involved in the project. Some meetings will be organized with the participation of representatives of all the provinces and the national level.
5- As part of this process, it is planned to organize a workshop to start the project implementation. In this meeting will be discussed in detail the work plan.
6- Previously, INSMET and UNDP will prepare a detailed work plan and a procurement plan. These plans will be disaggregated at the level of each territory and institution to facilitate the project organization. These plans will be the basic tool to monitor the project.
7- Monitoring will be results-oriented and will be based on the verifiable indicators identified in the logical framework (depending on the specific objective and each result).
8- Monitoring during the implementation phase will provide information that can serve as a basis for making decisions to established corrective actions or reinforce early signs of success.
9- In the work plan has been identified exchange with Cuba DIPECHO partners to share experiences during execution. There is a history of articulation in the context of the immediate response and recovery after Hurricane Sandy.

**4.5.2 Tick the box if one of the following studies will be undertaken:**

**External evaluation during the Action**

no

**External evaluation after the Action**

no

**External audit during the Action**

no

**External audit after the Action**

no

**Internal evaluation or internal audit related to the Action**

no

**4.5.3 Other studies***

no

**4.5.4 [INT] Report on changes and progress**

No changes

**4.5.5 [FIN] Report on changes, challenges orachievements**

No changes

## 5. TRANSITION (LRRD) AND CROSS-CUTTING ISSUES

**5.1 Describe the expected level of sustainability and/or connectedness**

The UNDP DIPECHO Project will generate the conditions so that each product will be sustainable.
The main objective is reducing the vulnerability of the hydro-meteorological EWS in the provinces affected by Hurricane Sandy by upgrading the equipment, transferring technologies, and strengthening local risk reduction management mechanisms through EWS coordination.
These actions are part and parcel of the strategy under implementation by INSMET for there-establishment and upgrading of its stations and coordination with institutions making up the EWS, using a hydro-meteorological information platform.
Software development for hydro-meteorological information processing and dissemination, and station assembly cost, start-up and operation are all taken up by national and local institutions using available qualified human resources.

**5.2 Transition and/or exit strategies (Linking Relief, Rehabilitation and Development)**

The project builds on the emergency actions initiated by the UN system after hurricane Sandy, specifically, actions to support the strengthening of the EWS to reduce risk with automated technology that generates hydro-meteorological information for local authorities. The continuity of this initiative responds to a strategy based on the automation of meteorological stations and approval of access to information through an integrated platform available in the national intranet for reducing vulnerabilities and risks of the territories.

Most significantly, this project builds on what was done in the province of Granma under another DIPECHO project which established the EWS of the Bayamo Watershed and linked it to the meteorological EWS.

**5.3 Mainstreaming (e.g. children, Disaster Risk Reduction, environmental impact , gender, HIV and AIDS, human rights, protection, others to be specified). In your explanation, point to significant elements introduced under 2.3 and 4.3.2.**

This proposal seeks to help recover from the passage of hurricane Sandy, which caused great environmental damage and severe impact on those living in the affected area, particularly their health and sanitary conditions. The government has guaranteed the protection of people, especially those most vulnerable such as children, the elderly, the disabled, and women, who often assume the care and protection of the family. The strategies of the action plan of Cuba have been supported by the UN system.

**5.4 [INT] In Case of changes or problems to be adressed, please explain**

No changes

**5.5 [FIN] In Case of changes or problems to be adressed, please explain**

No changes

## 6. FIELD COORDINATION

**6.1 Field co-ordination (indicate the Humanitarian Organisation's participation in coordination mechanisms with other relevant stakeholders, e.g. clusters, NGOs, UN agencies, others to be specified as well as the links with the Consolidated Appeal Process, when relevant)**

The response of other aid agencies in Cuba to DIPECHO Action Plan, such as OXFAM, CARE International, Civil Voluntary Group (GVC) and the International Red Cross, make it possible to work together to reduce risks in selected provinces, better articulate our respective interventions and to exchange lessons. Considering that some of these organizations may be working in the same geographic area, joint proposals, without replicating effort or resources, may be appropriate and necessary for strengthening coordination in these territories. After Hurricane Sandy, the UN system in Cuba has as a priority to support the affected areas with fund raising that respond to the needs identified. This action for strengthening preparedness and EWS complements initiatives in the immediate emergency phase that are being implemented directly with resources by the population.

Arrangements will be made with DIPECHO partners to jointly organize workshops on lessons learned and exchange forums on systematization of experiences. This includes activities to be organized in countries under the project and national thematic workshops. Coordination will also be pursued to guarantee the participation in DIPECHO regional events.

UNDP has been regularly holding exchange forums with DIPECHO partners within the framework of the Sandy response. A practice that has been followed consists in arranging joint field visits and information exchanges on procurement processes, and agreeing to jointly organize workshops on lessons learned.

There is close coordination between the UNDP Country Office in Cuba and the DRR Cluster at the UNDP Regional Centre in Panama in the implementation of the following actions:

1. Cuba's participation in the UNDP regional project entitled Caribbean Risk Management Initiative (CRMI), which seeks to replicate the experience of the Cuban RRMCs in the Caribbean.

2. 3. The Regional Centre supports technical exchanges on resilience, building upon the experience gained from hurricane Sandy's impact on Santiago de Cuba. This is a relevant topic to the DIPECHO project, considering the role of EWSs in DRR in a large city.

4. The Regional Centre supports the recovery phase under the hurricane Sandy Action Plan.

5. Cuba's participation in exchange forums organized by UNDP at the global and regional levels, within the framework of ISRD global and regional platforms.

6. The UNDP Regional Centre will advise on the organization of forums for the exchange and share of South-South cooperation in the framework of the regional project.

Close collaboration with regional ISDR will be ensured in order to:

- Coordinate the exchange in the topics covered by the DIPECHO project in Cuba in relation to the role of the EWS in the prevention and coordination with management tools RR.

**6.2 National and local authorities (relations established, authorisations, coordination)**

The proposal has been prepared in response to the priorities identified by national and local authorities. The support of INSMET, INRH and AMA will be key for the successful implementation of the project. Them, together with the provincial and municipal authorities are UNDP's key partners for purposes of project implementation. Systematic communication has been established with the authorities responsible for coordinating and implementing the planned actions in the field with the support of UN agencies involved in the project.

**6.3 Co-ordination with DG ECHO (indicate the Humanitarian Organisation's contacts with DG ECHO and its technical assistants in the field)**

During the implementation of the project close contact and coordination will be maintained with DG ECHO and ECHO technical assistants in the field with the purpose of ensuring it is regularly informed of project progress.

### 6.4 [INT] In case of changes or coordination problems, please explain

In March 2014, we were visited by Mrs. Ulrika Conradsson, LAC Chief at the European Commission in Brussels, and Mr. Jocelyn Lance, they met at UNDP headquarters in Cuba with the Deputy Representative ad interim, UNDP Programme Coordinator National Risk and Disaster Officer and specialists of INSMET to exchange about compliance with expected results and the state of cooperation between the two international cooperation agencies.

### 6.5 [FIN] In case of changes or coordination problems, please explain

During project's implementation, a systematic contact was maintained with ECHO regional office. We also had a visit from EU officials.
In March 2014, we were visited by Mrs. Ulrika Conradsson, DG ECHO, and Mr. Jocelyn Lance, ECHO regional office, they met at UNDP headquarters in Cuba with the Deputy Representative ad interim, UNDP Programme Coordinator National Risk and Disaster Officer and specialists of INSMET to exchange about compliance with expected results and the state of cooperation between the two international cooperation agencies
In December 2014, Mr. Jocelyn Lance and Mrs. Janire Zulaika, of the Regional ECHO Office for LAC made a visit to close the project in Cuba. They held several meetings with UNDP officials and national and local authorities to become familiar with the impact of this initiative. The EU representatives also held an exchange of views with Mrs. Myrta Kaulard, UNDP Resident Representative in Cuba; Mr. Claudio Tomasi, UNDP Deputy Resident Representative in the country; EMNDC representatives, and INSMET, INRH and AMA specialists. At AMA headquarters, they were informed about the comprehensive operational platform and procedure.
The mission also included a visit to the provinces covered by the project so as to see how the equipment that has been installed is working.

## 7. IMPLEMENTING PARTNERS

### 7.1 Name and address of implementing partner(s)

UNDP Cuba

Bárbara Pesce-Monteiro, Resident Representative, UNDP-Cuba
18th street, No 110, between 1st and 3rd streets, Miramar, Playa, La Habana,Cuba

### 7.2 Status of implementing partners (e.g. NGO, local authorities, etc.) and their role

The project will be implemented under the direct execution modality by UNDP.

Local and national authorities will participate directly in coordination, training and other consultation processes.

### 7.3 Type of relationship with implementing partner(s) and the expected reporting by the implementing partner

The UN system has a development framework agreement signed with the government from Cuba.

### 7.4 [INT] In case of changes, please explain

No changes

### 7.5 [FIN] In case of changes, please explain

No changes

## 8. CONTINGENCY MEASURES AND SECURITY

### 8.1 Contingency measures (Plan B/ mitigating actions to be taken if risks and assumptions spelled out in the log-frame materialised)

In the event of a disaster during the project implementation, the secure storage of the supplies purchased by the project will be coordinated.

The local and national authorities will be trained to undertake actions to protect all items acquired under the project.

### 8.2 Security considerations

#### 8.2.1 Security situation in the field, describe briefly

There are no security concerns in the implementation area other than the risk posed by the natural disasters described above

#### 8.2.2 Has a specific security protocol for this Action been established?

**Yes/No/Standard procedures**

Standard procedures

**If yes please elaborate**

#### 8.2.3 Are field staff and expatriates informed of and trained in these procedures? (Yes/No)

yes

### 8.3 [INT] In case of changes or problem to be addressed, please explain

No changes

### 8.4 [FIN] In case of changes or problem to be addressed, please explain

No changes

## 9. COMMUNICATION, VISIBILITY AND INFORMATION ACTIVITIES

### 9.1 Planned communication activities (in field and/or in Europe)

In the development of the communication and visibility strategy the "Joint Visibility Guidelines for EC-UN Actions in the Field" and the provisions of the General Conditions will be respected.

The EU and UNDP logos will be included in all public documents/information made available on the project.

At public events, the EU and UNDP logos will be visible as a banner and the contribution of EU-ECHO as the main donor will be clearly mentioned to the participants at the opening sessions.

Representatives from ECHO and/or UNDP will be invited to all major events/meetings and provided with an adequate time slot to make a presentation, if so wished.

A workshop will be planned around the International Day of Disaster Reduction in 2013 in coordination with other DIPECHO partners.

Press releases for all major activities of the project will be prepared and the media will be invited to attend the events.

All promotional material will carry the EU and UNDP logos and explain ECHO's role as the main donor.

### 9.2 Visibility on durable equipment, major supplies, and at action locations

The EU and UNDP logos and DIPECHO references will be explicit in all internal and external documents and materials produced as part of the project. At public events, the EU and UNDP logos will be visible as a roll-up or banner. The EU and UNDP logos will be visible on stationary used for the project.

### 9.3 Planned publication activities

Two publications are envisaged under this project:
- A publication of the hydro-meteorological EWS related experiences developed as part of the project (electronic version).
- A publication titled "Women in Cuba DRR" which is an analysis of the role of women as decision makers in DRR at different levels within the community.

### 9.4 [INT] In case of changes, please explain

The project is ongoing. However a group of stickers was printed with the logos of the EU and the UNDP for the identification of the means and the acquired materials. They were already put in the satellite antennas and PC. Annex 9.

### 9.5. [FIN] Report on the relevant activities

The project systematization was published within the project framework. It included the lessons learned over its implementation and also highlights its impact directly for men and women related to this experience. Didactic materials to share with the scientific and technical community developed material on these issues in management for disaster risk reduction and a multimedia concentrate all digital versions of these materials were also published. For the novelty and importance of the materials produced in the project were shared in the III International Conference for Disaster and Risk Reduction in Sendai, Japan. The visibility of participating institutions has been guaranteed on a permanent basis. (See Annexes 1; 2:3; 4; 5; 6; 7; 8; 9; 10; 11; 16):

## 10. HUMAN RESOURCES

### 10.1 Indicate global figures per function and status

| Function | Status | Number of staff | Number of man/month in project | Comments |
|---|---|---|---|---|
| Project Manager | Local staff | 1 | 19,00 | UNDP project staff in charge of the coordination processing |
| Monitoring Assistant | Local staff | 1 | 18,00 | UNDP project staff in charge of the field monitoring |
| Financial Assistant | Local staff | 1 | 18,00 | UNDP project staff in charge of financial issues |
| National Coordinator | Implementing partner | 1 | 6,00 | UNDP's implementing partner's staff in charge of coordinating the cooperation of the project's actors from different agencies |
| Hydrometeorological Specialist | Implementing partner | 3 | 12,00 | UNDP's implementing partner's staff in charge of identifying the technology and assess the project development |
| System Programmer | Implementing partner | 2 | 12,00 | UNDP's implementing partner's staff in charge of software systems development |

**Comments :**

### 10.2 [INT] In case of changes, please explain

No changes

### 10.3 [FIN] In case of changes, please explain

In December 2014, an extension was approved for payment to the project manager until January 2015, taking into account the final monitoring actions under implementation in the provinces and the preparation of the Final Report.

## 11. Financial overview

| Eligible costs of Action | Initial Amount | Revised Budget | Intermediate report committed | Final report |
|---|---|---|---|---|
| Hydro-meteorological information processing equipment | 281.760,00 € | 281.760,00 € | 74.725,62 € | 281.092,06 € |
| Mobile laboratory | 60.000,00 € | 60.000,00 € | 46.256,32 € | 60.000,00 € |
| Computing and network equipment | 23.200,00 € | 23.200,00 € | 0,00 € | 23.200,00 € |
| Other equipment and furniture | 96.890,00 € | 96.890,00 € | 31.953,24 € | 89.880,56 € |
| Travel, DSA, accommodation | 60.897,00 € | 60.897,00 € | 17.196,25 € | 66.457,48 € |
| Publications design, edition & printing | 16.080,00 € | 16.080,00 € | 585,99 € | 25.821,88 € |
| Consumables & goods costs | 7.140,00 € | 7.140,00 € | 2.434,57 € | 6.760,75 € |
| Other costs (transportation service, contract service, monitoring) | 83.490,00 € | 83.490,00 € | 64.209,10 € | 83.490,00 € |
| **Subtotal direct eligible costs = Sum of total amount for all results (553.212,73 €) + Other costs (83.490,00 €) = 636.702,73 €** | 629.457,00 € | 629.457,00 € | 237.361,09 € | **636.702,73 €** |
| **Indirect costs (max. 7%) = (44.569,19 €)** | 44.061,00 € | 44.061,00 € | 16.615,28 € | 37.420,56 € |
| **Total Costs :** | 673.518,00 € | 673.518,00 € | 253.976,37 € | **674.123,29 €** |

| Funding of action | Initial | Revised | Final State |
|---|---|---|---|
| Direct revenue from Action | 0,00 € | 0,00 € | 0,00 € |
| Contribution by applicant | 101.518,00 € | 101.518,00 € | 102.123,29 € |
| Contribution by other donors | 0,00 € | 0,00 € | 0,00 € |
| Contribution requested from ECHO | 572.000,00 € | 572.000,00 € | **572.000,00 €** |
| % of total funding | 85 % | 85 % | **85 %** |
| Contribution by beneficiaries | | | 0 € |
| Total Funding : | 673.518,00 € | 673.518,00 € | **674.123,29 €** |

**11.1[FIN] In case of other donors, please identify the donors and the amount provided**

## 12. ADMINISTRATIVE INFORMATION

### 12.1 FPA number (if applicable)

2008|FAFA|Y

### 12.2 Name and title of legal representative signing the Agreement

Mr Antonio VIGILANTE - Director of UNDP Brussels Office

### 12.3 Name, telephone, e-mail and title of the person(s) to be mentioned in Article 7 of the Agreement

| Name | Title | Phone | Fax | E-mail |
|---|---|---|---|---|
| Antonio Vigilante | Director UNDP Office in Brussels | 3225054620 | 3225054729 | brussels.office@undp.org |
| Barbara Pesce-Monteiro | Resident Coordinator UN system in Cuba and Resident Representative UNDP-Cuba | 5372041492 | 5372041517 | barbara.pesce-monteiro@undp.org |

### 12.4 Name, telephone, fax and e-mail of the representative in the area of intervention

| Name | Phone | Fax | E-mail | Address |
|---|---|---|---|---|
| Barbara Pesce-Monteiro | 5372041492 | 5372041517 | barbara.pesce-monteiro@undp.org | 18th street No. 118 Miramar, La Habana, Cuba |

### 12.5 Bank account

**Full account number (including bank codes)**

BE80 301-0186139-77

**Name of bank / Address of branch**

ING Belgium

24, Avenue Marnix

**Precise denomination of the account holder**

United Nations Development Programme UNDP

**IBAN account code, (or BIC country code if the IBAN code does not apply)**

BE80 301018613977

## 13. CONCLUSIONS AND HUMANITARIAN ORGANISATION'S COMMENTS

### 13.1 Comment at proposal stage and requests for derogation

### 13.2 [INT] Comments and requests for derogation

No comments

### 13.3 [FIN] Conclusion and final remarks

The implementation of this proposal in Santiago de Cuba, Holguin, Granma and Las Tunas provinces affected by Hurricane Sandy has been very important for the strengthening of hydrometeorological EWS. From technological upgrade to production procedures, methodologies and software; this project is a reference for other regions in the country.
For the Cuban authorities the reduction of disaster risks is priority of the civil defense system. Therefore is planned the continuity of actions that enlarge the range and benefit of its results and lesson learned experiences.
Likewise the UNDP establishes this thematic in their commitment to serve the people and nations.
Hence, UNDP Cuba together with national and local authorities has submitted a new proposal under DIPECHO 2015-2016 to strengthen the hydrometeorological EWS in the central region of the country, and directly linked to watershed.
The support of ECHO and UNDP in this area has strengthened the exchange with the institutions responsible for these services, based on the protection of people and economic resources as a premise for development and humanitarian aid.

## Annex A: Procurement table

### Supplies, services or works

| Description | Quantity | Amount (EUR) | Procurement procedure | Derogation (Y/N) | (Forecast) Launch date procedure | duration (weeks) | (Forecast) Contracting date | duration (weeks) |
|---|---|---|---|---|---|---|---|---|

### Procurement comments

Annex B: Checklist on information to be found in the final reports for validation of the payment request

**In order to facilitate the assessment of reports, use the below checklist and attach the documents to the Final Report**

**Payment request**

Compulsory ☒ Included

**Detailed financial report coherent with Table 11 headings**

Compulsory ☒ Included

**List of expatriate and key management staff**

☒ Not applicable ☐ Included

**List of other persons (e.g. local staff, day labourers)**

☒ Not applicable ☐ Included

**List of HQ staff directly involved in the Action (except traditional HR and administrative functions)**

☒ Not applicable ☐ Included

**List of other personnel costs**

☒ Not applicable ☐ Included

**List of Allowance of low value equipment**

☒ Not applicable ☐ Included

**List of depreciation of equipment**

☒ Not applicable ☐ Included

**List of fully charged equipment**

☒ Not applicable ☐ Included

**Supporting documents for donation of fully charged equipment or remaining stock**

☒ Not applicable ☐ Included

**List equipment or remaining stocks transferred to another EC funded Action**

☒ Not applicable ☐ Included

**List of goods**

☒ Not applicable ☐ Included

**List of stationery and running costs**

☒ Not applicable ☐ Included

**List of Service / Transports/ work contracts**

☒ Not applicable ☐ Included

**List of Studies/audits/evaluations**

☒ Not applicable ☐ Included

**List of Communication, Visibility and Information costs**

☒ Not applicable ☐ Included

**List of miscellaneous costs**

☒ Not applicable ☐ Included

**List of procurement**

☒ Not applicable ☐ Included