



An initiative of the African, Caribbean and Pacific Group,  
funded by the European Union, and implemented by:



## **CARIBBEAN INSTITUTE FOR METEOROLOGY AND HYDROLOGY**

### **EXPANDED WEATHER AND CLIMATE FORECASTING AND INNOVATIVE PRODUCT AND SERVICE DEVELOPMENT AND DELIVERY IN THE CARIBBEAN PROJECT**

### **CONSULTANCY SERVICES FOR DEVELOPMENT OF CLIMATE EARLY WARNING FOR MOSQUITO VECTOR, *Aedes Aegypti*, PROLIFERATION**

#### **REQUEST FOR EXPRESSIONS OF INTEREST**

The Caribbean Institute for Meteorology and Hydrology (CIMH) has received financing from the Caribbean Development Bank (CDB) in an amount equivalent to EUR773,025 towards the cost of Expanded Weather and Climate Forecasting and Innovative Product and Service Development and Delivery in the Caribbean Project and intends to apply a portion of the proceeds of this financing to eligible payments under a contract for which this invitation is issued. Payments by CDB will be made only at the request of the CIMH and upon approval by CDB, and will be subject in all respects to the terms and conditions of the Financing Agreement. The Financing Agreement prohibits withdrawal from the financing account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of CDB, is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. No party other than the CIMH shall derive any rights from the Financing Agreement or have any claim to the proceeds of the Financing.

The CIMH, the Implementing Agency, now wishes to procure consultancy services for the development of Climate Early Warning for Mosquito vector, *Aedes aegypti*, Proliferation.

The objective of the consultancy is to develop a modelling framework to provide spatio-temporal probabilistic forecasts of *Aedes aegypti* proliferation. Further details can be found in the attached Terms of Reference (Appendix 1). The duration of the assignment is expected to be for a period of 12 months.

The CIMH now invites interested eligible consulting firms to submit Expressions of Interest for the provision of these consultancy services.

Consultants shall be eligible to participate if:

- (a) in the case of a body corporate, it is legally incorporated or otherwise organised in an eligible country, has its principal place of business in an eligible country and is more than 50 per cent beneficially owned by citizen(s) and/or *bona fide* resident(s) of eligible country(ies) or by a body(ies) corporate meeting these requirements;
- (b) in the case of unincorporated firms, the persons are citizens or *bona fide* residents of an eligible country; and
- (c) in all cases, the consultant has no arrangement and undertakes not to make any arrangements, whereby any substantial part of the net profits or other tangible benefits of the contract will accrue or be paid to a person not a citizen or *bona fide* resident of an eligible country.

Eligible countries are outlined in Appendix 2 below.

The attention of interested Consultants is drawn to paragraph 1.9 of CDB's Guidelines for the Selection and Engagement of Consultants (2011), setting forth CDB's policy on conflict of interest.

In the assessment of submissions, consideration will be given to technical competence, qualifications and experience, local and regional experience on similar assignments, financial capability and existing commitments. All information must be submitted in English. Further information may be obtained from the first address below between 8:00 and 16:00 hours Monday to Friday.

Submissions in PDF format of the Expressions of Interest must be received at the email address, [projects@cimh.edu.bb](mailto:projects@cimh.edu.bb) and copied to [procurement@caribank.org](mailto:procurement@caribank.org), no later than 16:00 AST on Monday, May 21, 2018.. The email containing each submission should include the name and address of the applicant and shall be clearly marked "**Expression of Interest – Consultancy Services for Development of Climate Early Warning for Mosquito Vector, Aedes Aegypti Proliferation.**"

The selection method shall be Consultants' Qualifications Selection. Therefore, following the assessment of submissions, firms shall be assessed and compared, and the best qualified and experienced firm shall be selected. Only the selected firm shall be asked to submit a combined technical and financial proposal and, if such proposal is responsive and acceptable, be invited to negotiate a contract. The CIMH reserves the right to accept or reject late applications or to cancel the present invitation partially or in its entirety. It will not be bound to assign any reason for not selecting any applicant and will not defray any costs incurred by any applicant in the preparation and submission of Expressions of Interest

1. *Address 1*

Project Officer  
Caribbean Institute for Meteorology and Hydrology  
Husbands.  
St. James BB23006  
BARBADOS, W.I.  
Tel: +1-(246) 425-1362/63  
Fax: +1-(246)-424-4733  
Email: [projects@cimh.edu.bb](mailto:projects@cimh.edu.bb)

2. *Address 2*

Procurement Officer  
Procurement Policy Unit  
Caribbean Development Bank  
P.O. Box 408, Wildey  
St. Michael  
BARBADOS, W.I.  
Tel: +1- (246) 431-1600  
Fax: +1- (246) 426-7269  
Email: [procurement@caribank.org](mailto:procurement@caribank.org)

**TERMS OF REFERENCE**

**CONSULTANCY FOR THE DEVELOPMENT OF CLIMATE EARLY WARNING FOR  
MOSQUITO VECTOR, *Aedes aegypti*, PROLIFERATION**

**1. INTRODUCTION**

Small island developing states (SIDS) are extremely vulnerable to the impacts of climate variability and change. Many SIDS have been experienced high socio-economic burdens from climate-sensitive health outcomes, including morbidity and mortality from extreme events related to vector, food and waterborne diseases. Climate variability is a significant environmental driver of vector-borne diseases such as Yellow Fever, Dengue Fever, Chikungunya and Zika which, at various times, have encumbered national health care and productivity systems in the Caribbean. For instance, it is estimated that Dengue Fever costs the Caribbean about USD321 million annually<sup>1</sup>. The Caribbean remains the area within the Americas with the highest cost per capita (International dollars \$8.70) (Shepard, Coudeville, Halasa, Zambrano, and Dayan, 2011) with about 9,000 years of lost time due to ill health and premature deaths<sup>2</sup> as a result of dengue. The health sector in the Caribbean SIDS will likely see increases in climate related health impacts under predicted future climate.

Yellow Fever, Dengue Fever, Chikungunya and Zika in the Caribbean share a common vector, the *Aedes aegypti* mosquito whose proliferation is climate sensitive. Tropical and sub-tropical climate conditions allow the *Aedes aegypti* mosquito to thrive during warmer, wetter and more humid months and the distribution and abundance of that vector may be affected by even small changes in ambient temperature and precipitation. In the Caribbean, prior research observed a link between past climate trends, increased mosquito incidence and Dengue Fever Risk. For example, Dengue Fever occurrence in the Caribbean is known to follow a seasonal pattern to a large extent, with most cases occurring during the second half of the year when temperatures are warm and precipitation and humidity high (Taylor et al, 2009)<sup>3</sup>.

In the Caribbean, there is a need to invest more resources to better understand climate risks in the health sector and to develop effective and efficient mitigation strategies. While understanding climate risk in the health sector across all timescales is an aspirational goal, building models and frameworks to understand climate health risks at short time scales (seasonal and sub-seasonal scales) where climate predictions are better constrained represents a reasonable confidence-building approach that could pay substantial dividends. The development of models to predict climatic conditions favourable to the proliferation, and in particular, the spatial and temporal distribution of *Aedes aegypti* populations, is a key step towards evidence-based vector surveillance and control at the national level. The outputs of the modelling framework is intended to alert public health systems and facilitate adequate and timely responses to reduce the incidence of *Aedes aegypti* -borne viral infections.

**2. The Caribbean Institute for Meteorology and Hydrology (CIMH)**

The CIMH is an institution of the Caribbean Community and the technical organ of the Caribbean Meteorological Organisation (CMO). The mandate of the CIMH is to assist in improving and developing the meteorological and hydrological services as well as, providing the awareness of the benefits of

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<sup>1</sup> Source: [https://sta.uwi.edu/uwitoday/archive/april\\_2013/article6.asp](https://sta.uwi.edu/uwitoday/archive/april_2013/article6.asp). This estimate does not consider the costs of surveillance, mosquito control and public education programmes or the impact of disruption to the rest of the healthcare system when an outbreak occurs.

<sup>2</sup> Source: <http://www.guardian.co.uk/news/2013-03-25/dengue-costs-caribbean-us321m-year>.

<sup>3</sup> Taylor M. A., A. A. C., and W. Bailey, (2009). Review of Health Effects of Climate Variability and Climate Change in the Caribbean (M. A. T. C. C. Project, Trans.) (pp. 85). Belmopan, Belize: Caribbean Community Climate Change Centre (CCCCC).

meteorology and hydrology for the economic well-being of the 16 CMO Member States. This is achieved through training, research, investigations, and the provision of related specialised services and advice.

In achieving its mandate, the CIMH has established an affiliation with the UWI where its primary responsibility is the delivery of the Bachelor of Science Programme in Meteorology in the Faculty of Pure and Applied Sciences. The CIMH is also recognised by the World Meteorological Organisation (WMO) as: (i) the WMO regional training centre in the Caribbean for meteorology and hydrology and related disciplines; (ii) a regional instrument centre for the Caribbean; (iii) centre of excellence in satellite meteorology training; and (iv) the WMO regional climate centre (in demonstration phase) for the Caribbean.

In addition, the CIMH is a repository for the climate data from CMO Member States. The institute is also an important Caribbean Centre for research and development related to meteorology, hydrology, agro-meteorology and climate in the Caribbean. It is active in such areas of hydrological risk impacts forecasting and agricultural risks forecasting and has had strong collaborations with other regional institutions, national organisations in CMO Member States and the international community.

### **Expanding Weather and Climate Forecasting and Innovative Product and Service Development and Delivery in the Caribbean Project**

The CIMH is implementing the 2-year ACP-EU-CDB NDRM in CARIFORUM Countries funded *Expanding Weather and Climate Forecasting and Innovative Product and Service Development and Delivery in the Caribbean Project*. This project outcome is expected to increase predictive capacity of national and regional institutions for weather and climate forecasting. The project component 3 seeks to develop a new or advance the development of existing modelling framework(s) to provide spatio-temporal probabilistic forecasts of *Aedes aegypti* proliferation.

### **3. CONSULTANCY AIM AND OBJECTIVES**

The overall objective of this assignment is to develop a new, or advance the development of an existing, modelling framework to provide spatio-temporal probabilistic forecasts of *Aedes aegypti* proliferation. To achieve this objective, this technical assistance will adopt a comprehensive approach to develop/modify, calibrate and verify predictive models relating climate variables to spatial patterns of *Aedes aegypti* populations in at least two pilot countries drawn from Borrowing Member Countries (BMCs). The resulting models should facilitate the development of outlooks for the spatial and temporal distributions of populations of *Aedes aegypti* for at least up to three months with a zero month lead time, using information on the climatic conditions for the Caribbean. The outputs of the models should provide probabilistic maps that can be used for vector surveillance and control.

The consultancy should also facilitate:

- (a) the development of regional and international collaborations to support long-term research and development of climate early warning systems for vectors that pose health threats; and
- (b) a capacity building exercise in health-climate spatio-temporal model development for regional and national representatives.

#### 4. SCOPE OF WORK

Within the framework of the Expanded Weather and Climate Forecasting and Innovative Product and Service Development and Delivery in the Caribbean Project in the Caribbean Project, the scope of work is understood to cover all activities necessary to accomplish the objectives of the consultancy, whether or not a specific activity is cited in these Terms of Reference. A participatory and consultative approach with the national focal agencies and regional key collaborators, particularly the Caribbean Public Health Agency (CARPHA), the Pan American Health Organization (PAHO) and the CIMH, must be adopted in the conduct of these services. Specific duties and responsibilities of the Consultant include but are not limited to:

- (a) in collaboration with CARPHA and CIMH, define the methodology, including potential models that will be considered for the study, for conducting the research including development of the criteria for the selection of two pilot countries drawn from BMCs for the study;
- (b) update the methodology, including potential models that will be considered for the study, if required, based on available data, feedback from the pilot countries and regional partners including CIMH, CARPHA and PAHO among others;
- (c) demonstrate the approach in the two pilot countries;
- (d) prepare a Draft Report on the study and conduct in-country workshops to share the draft findings with national and regional stakeholders;
- (e) conduct a regional training workshop to train regional and national experts on how to conduct similar studies and develop similar products; and
- (f) prepare a Final Report.

#### 5. CONSULTANT DELIVERABLES

1.	An Inception Report
2.	A methodology Report (inclusive of data needs and results of country visits and meetings with regional stakeholders)
3.	A Draft Modelling Report
4.	A Final Model Report
5.	A report on Capacity Building Workshops (2 national workshops and 1 regional workshop)
6.	Final Project Report

#### 6. QUALIFICATIONS

The Consultant is required to have recognised credentials in Epidemiology, Public Health and or Statistics with demonstrated experience conducting similar assessment studies. In addition, the Consultant must have:

- (a) more than ten years of experience conducting climate related vector studies with preferred experience in areas related to climate and the mosquito vector;

- (b) more than five years experience training persons to conduct similar assessments; and
- (c) experience working with developing countries and or SIDS with preferred experience working in the tropics.

## **7. DURATION**

The contract is expected to be completed within one year.

**EUROPEAN UNION ELIGIBILITY RULES**  
**AFRICAN CARIBBEAN PACIFIC – EUROPEAN UNION**  
**NATURAL DISASTER RISK MANAGEMENT**

**PARTICIPATION IN PROCEDURES FOR THE AWARDING OF**  
**PROCUREMENT CONTRACTS OR GRANT CONTRACTS**

1. Participation in procedures for the award of procurement contracts financed under the EU Contribution Agreement for the Implementation for the Action entitled: “Africa Caribbean Pacific – European – Caribbean Development Bank (ACP-EU-CDB) Natural Disaster Risk Management in CARIFORUM Countries” (ACP – EU NDRM Resources)”, is open to international organisations and all natural persons who are nationals of, or legal persons who are established in, an eligible country.

2. Eligible countries<sup>1</sup> are deemed to be:

(a) Caribbean Development Bank member countries:

Anguilla, Antigua and Barbuda, Barbados, Belize, Brazil, British Virgin Islands, Canada, Cayman Islands, China, Columbia, Dominica, Germany, Grenada, Guyana, Haiti, Jamaica, Italy, Mexico, Montserrat, St Kitts and Nevis, Saint Lucia, St Vincent and the Grenadines, Suriname, The Bahamas, Trinidad and Tobago, Turks and Caicos Islands, the United Kingdom and Venezuela.

(b) Members of the “African, Caribbean and Pacific (ACP) Group of States”<sup>2</sup>:

**Africa:**

South Africa<sup>3</sup>, Angola, Benin, Botswana, Burkina Faso, Burundi, Central African Republic, Cameroon, Cape Verde, Chad, Comoros Islands, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Equatorial Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Uganda, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, Sudan, Swaziland, Tanzania, Togo, Zambia and Zimbabwe.

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<sup>1</sup> Note some countries may be eligible by virtue of more than one category

<sup>2</sup> Cotonou Partnership Agreement of 23 June 2000 (as amended by the provisional application of Decision No 1/2000 of the ACP-EC Council of Ministers of 27 July 2000, Decision No 1/2000 of the ACP-EC customs cooperation committee of 18 October 2000, Decision No 1/2001 of the ACP-EC customs cooperation committee of 20 April 2001, Decision No 2/2001 of the ACP-EC customs cooperation committee of 20 April 2001, Decision No 3/2001 of the ACP-EC customs cooperation committee of 10 May 2001, Decision No 4/2001 of the ACP-EC customs cooperation committee of 27 June 2001, Decision No 5/2001 of the ACP-EC customs cooperation committee of 7 December 2001, Decision No 2/2002 of the ACP-EC customs cooperation committee of 28 October 2002, Decision No 1/2003 of the ACP-EC Council of Ministers of 16 May 2003, Council Decision (EC) of 19 December 2002, Decision No 1/2004 of the ACP-EC Council of Ministers of 6 May 2004, Decision No 2/2004 of the ACP - EC customs cooperation committee of 30 June 2004 and Decision No 4/2005 of the ACP-EC customs cooperation committee of 13 April 2005).

<sup>3</sup> Natural and legal South African persons are eligible to participate in contracts financed by the 10th/11th EDF. However, the 10th/11th EDF does not finance contracts in South Africa.

**Caribbean:**

Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago.

**Pacific:**

Cook Islands, East Timor, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, the Solomon Islands, Western Samoa, Tonga, Tuvalu, Vanuatu.

**Overseas Countries and Territories:**

Anguilla, Antarctic, Netherlands Antilles, Aruba, British Indian Ocean Territory, British Virgin Islands, Cayman Islands, Falkland Islands (Malvinas), French Polynesia, French Southern Territories, Greenland, Mayotte, Montserrat, New Caledonia, Pitcairn, Saint Helena, Saint Pierre and Miquelon, South Georgia and South Sandwich Islands, Turks and Caicos, Wallis and Futuna Islands.

- (c) A Member State of the European Union:

Austria, Belgium, Bulgaria, Croatia, Czech republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

**An official candidate country of the European Union:**

The Former Yugoslav Republic of Macedonia, Turkey, Iceland, Montenegro.

**A Member State of the European Economic Area:** Iceland, Lichtenstein, Norway.

- (d) All natural persons who are nationals of, or legal persons who are established in, a Least Developed Country as defined by the United Nations:

Afghanistan, Angola, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Comoros, Dem. Rep. Congo, Equatorial Guinea, Eritrea, Ethiopia, Guinea, Guinea-Bissau, Haiti, Kiribati, Lao PDR, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Djibouti, Solomon Islands, Somalia, South Sudan, Sudan, Tanzania, The Gambia, Timor-Leste, Togo, Tuvalu, Uganda, Vanuatu, Yemen, Rep. and Zambia.

- (e) Participation in procedures for the award of procurement contracts or grants financed from the Facility shall be open to all natural persons who are nationals of, or legal persons established in, *any country other than those referred to in paragraph 1, where reciprocal access to external assistance has been established*. Reciprocal access in the Least Developed Countries as defined by the United Nations (UN) shall be automatically granted to the OECD/DAC members: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

3. Services under a contract financed from the Facility may be provided by experts of any nationality, without prejudice to the qualitative and financial requirements set out in the Bank's procurement rules.

4. Supplies and materials purchased under a contract financed from the Facility must originate in a State that is eligible under paragraph 1. In this context, the definition of the concept of 'originating products' shall be assessed by reference to the Bank's prevailing procurement guidelines/procedures, and supplies originating in the EU shall include supplies originating in the Overseas Countries and Territories.

5. Whenever the Facility finances an operation implemented through an international organisation, participation in procedures for the award of procurement contracts or grants shall be open to all natural and legal persons who are eligible under paragraphs 1, care being taken to ensure equal treatment of all donors. The same rules apply for supplies and materials.

6. Whenever the Facility finances an operation implemented as part of a regional initiative, participation in procedures for the award of procurement contracts or grants shall be open to all natural and legal persons who are eligible under paragraph 1, and to all natural and legal persons from a country participating in the relevant initiative. The same rules apply for supplies and materials.

7. Whenever the Facility finances an operation co-financed with a third entity, participation in procedures for the award of procurement contracts or grants shall be open to all natural and legal persons eligible under paragraph 1, and to all persons eligible under the rules of the third entity. The same rules shall apply to supplies and materials.

**Caveat:** The Bank and EU eligibility requirements are subject to change by the Bank and the EU. The applicant is responsible for checking whether there have been any updates on the eligibility requirements, as well as the UN's list of Least Developed Countries.

