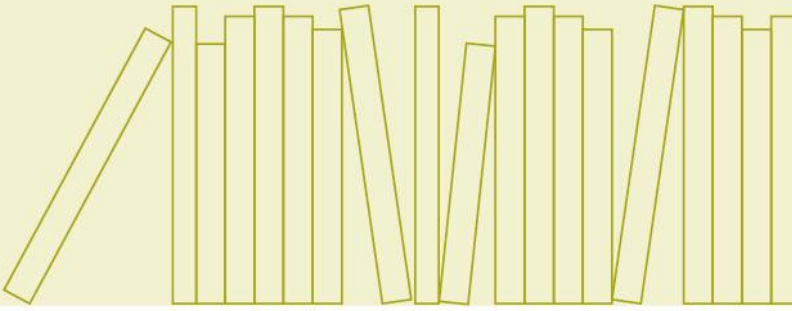
Economic Commission for Latin America and the Caribbean

ECLAC SUBREGIONAL HEADQUARTERS FOR THE CARIBBEAN

Report of the expert group meeting to review a study on applications of geospatial technologies and data in support of disaster risk management in the Caribbean



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Economic Commission for Latin America and the Caribbean
Subregional Headquarters for the Caribbean

Expert group meeting to review a study
on applications of geospatial technologies and data
in support of disaster risk management in the Caribbean

Virtual meeting, 13 October 2021

LIMITED
LC/CAR/2021/4
21 October 2021
ORIGINAL: ENGLISH

REPORT OF THE EXPERT GROUP MEETING TO REVIEW A STUDY ON APPLICATIONS OF GEOSPATIAL TECHNOLOGIES AND DATA IN SUPPORT OF DISASTER RISK MANAGEMENT IN THE CARIBBEAN

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CONTENTS

A. ATTENDANCE AND ORGANIZATION OF WORK

1. Place and date

1. The Economic Commission for Latin American and the Caribbean (ECLAC) convened an expert group meeting to review a study titled "Applications of geospatial technologies and data (GST/D) in support of disaster risk management in the Caribbean". The meeting took place virtually by Webex on 13 October 2021.

2. Attendance

2. There were 17 persons in attendance including representatives from the following organizations: Office of Disaster Preparedness and Management (ODPM) Trinidad and Tobago, the Tobago Emergency Management Agency (TEMA), the University of the West Indies, Faculty of Food and Agriculture Department of Food Production, the Statistics Division of the United Nations Economic Commission for Latin America and the Caribbean, the Caribbean Disaster Emergency Management Agency (CDEMA), the Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC), the Bahamas National Geographical Information System Centre, and the consultant to the present study.

3. Meeting agenda

1. Agenda item 1: Opening of meeting

2. Agenda item 2: Presentation of report "Applications of geospatial technologies and data in support of disaster risk management in the Caribbean"

3. Agenda item 3: Discussion

4. Closure of the meeting

B. SUMMARY OF PROCEEDINGS

1. Opening of the meeting

3. The Deputy Director of ECLAC subregional headquarters for the Caribbean welcomed all participants online. He explained that the purpose of the meeting was to engage discussion on the study "Applications of geospatial technologies and data in support of disaster risk management (DRM) in the Caribbean". He also thanked the CCRIF SPC for its partnership in financing the research, and a related training workshop in the use of geospatial technologies and data which was held previously.

4. The CCRIF SPC representative also welcomed experts to the meeting and noted the extensive collaborative relationship which it has enjoyed with ECLAC over more than a decade. After offering a brief synopsis of the CCRIF SPC operational model, she then identified several key policy implications for the study for CCRIF SPC, noting its importance in enhancing the use of, and accessibility to geospatial technologies and data in DRM; contribution to the use of technology and innovation in DRM; raising awareness among Caribbean publics on the usefulness and GST/D; and applying geospatial technologies and data in order to improve policy recommendations for DRM in the Caribbean subregion.

2. Presentation of the report "Applications of geospatial technologies and data in disaster risk management in the Caribbean"

5. This report was presented by Jacob Opadeyi, consultant to ECLAC, in the conduct of the study. In introducing this presentation, the consultant noted that while the study revealed some improvements in the use of GST/D overtime, there remain critical gaps in the use of these technologies in the subregion. He informed that the study was conducted in 10 Caribbean countries and territories these being: the Bahamas, Barbados, the British Virgin Islands, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Trinidad and Tobago, Turk and Caicos Islands, and Sint Maarten. Most of the limitations related to insufficient institutional capacity to surmount issues related to database design and maintenance; poor or non-existent protocols for national and regional data sharing; high variability of GST/D technology across the subregion; insufficient funds for technology acquisition and maintenance. and inadequate human resources. The study focussed on the institutional requirements for effective mainstreaming of GST/D; issues with data and database management; the human capacity environment; and use of GST/D in the development of DRM applications in the subregion, and a strengths, weaknesses, opportunities, and threats (SWOT) analysis. Among some of the specific findings of the study presented were the following:

(a) Findings:
   (i) Some countries may have GST/D, but these are not deployed and shared with the national disaster agency. Noting the exception of Jamaica, the consultant informed that over the last two years, Jamaica has achieved some level of integration, which has led to the creation of the National Emergency Response GIS Team (NERGIST).
   (ii) Most DRM agencies in the Caribbean subregion are not supported to have their own GST/D infrastructure. The consultant noted, however that this challenge could be overcome through horizonal cooperating amongst other agencies.
   (iii) Planning agencies, public-works and other key national agencies should be fully integrated with all national agencies. The consultant cited further example as seen in the British Virgin Islands.
   (iv) Meta data, while very important for integrating and data sharing is largely lacking among Caribbean GST/D practitioners.
   (v) Data dictionary adjusted to the Caribbean SIDS context was needed for the effective application of GST/D.
   (vi) Generally, most GST/D developments in the subregion are externally funded via projects.
   (vii) Most Caribbean countries are currently using opened sourced software to upgrade. However, this needs dedicated personnel to keep abreast and have the knowledge on selection and use of these technologies and resources.
   (viii) Human capacity for GST/D is very limited in the subregion particularly with respect to the use of spatial imagery and drone technologies.

(b) Some recommendations from the study on possible applications of GST/D in national and subregional strategies were also shared as follows:
   (i) Tracking of physical development trends (rate and direction) for mitigation planning.
   (ii) Support for building approval assessment applications in terms of risk assessment.
   (iii) Impact assessment of approved developments.
   (iv) Predictive modelling of land use activities.
   (v) Use of drone technology to track informal settlements and natural hazards.

(vi) Mobile Geographical Information System (GIS) and drone field mapping and reporting of violations of development guidelines.
(vii) Hazard risk assessment.
(viii) Community vulnerability assessment.
(ix) Monitoring and evaluation of evacuation routes.
(x) Ground truthing or validation of hazard risk maps or models.
(xi) Disaster damage assessment.

3. Discussion

6. The Economic Affairs Officer of the Sustainable Development and Disaster Unit (SDDU) then invited the participating experts to share their views on the study. The consensus from the floor, based on the participants comments that the study was a comprehensive examination and assessment of the geospatial technology and data and its application in disaster risk management (DRM) in the countries that responded to the survey. They commended Jacob Opadeyi, ECLAC consultant, and CCRIF SPC for this body of work which yielded clear insights into the status quo.

7. The first intervention was received from the GIS Specialist, Caribbean Disaster Emergency Management Agency (CDEMA). She expressed gratitude for the foundational body of work that was done for this study by the consultant, ECLAC and CCRIF SPC but expressed disappointment that only half of CDEMA's member countries participated in the survey. She referred to specific areas in the study for possible amendments, on page 43 and recommended that a list of open-sourced applications be included, since many countries struggled with budgetary constraints, as funding for GST/D was often not considered a top priority. Additionally, she believed the study should mention the use of open-sourced applications as a minimum standard and the other software application for countries that could afford those applications. Regarding the figure on page 20, she recommended emphasis be placed on the attributes of the data sets. She explained that attribute tables are critical for proper and efficient analysis of data, such as for example, in assessing a building, which would require information on the type of building and the construction materials all of which are important during the recovery process. Consideration of gender information was another point she raised, as this was critical in guiding action at shelters. Further reference was made to figure 1 on page 20, and she believed that it should accommodate a 'seat at the table' for all national agencies since linkages among key national players were critical to the successful functioning of GST at the national level.

8. Next was an intervention from the SDDU Coordinator, ECLAC subregional headquarters for the Caribbean, who sought to provide context to the meeting participants. She explained that the deployment of the survey during the pandemic proved challenging, especially in identifying the most appropriate department to direct the survey. Nonetheless, she thought the subsequent workshops proved to be a catalyst in the case of some countries encouraging them to become more engaged in the study and this body of work. Many of these challenges were captured in the study's recommendations.

9. The representative from the University of the West Indies, Faculty of Food and Agriculture, Department of Food Production, asked whether consideration was made to accommodate data collection, standardization and harmonization of data. He also advocated for the formalization of GST/D in the national information systems, so that all agencies could access relevant information via a national database. Further, in view of the impacts climate change in the region he suggested the inclusion of climatic data sets in the DRM system as disasters are linked to climate change.

10. The final intervention for this first round of comments was made by the GIS Specialist, Office of Disaster Preparedness and Management (ODPM) of Trinidad and Tobago. He inquired about the minimum

hardware requirements for countries. He thought eight computers may be outside the budget of many countries and asked whether fewer computers could be used. He also inquired about the minimum staffing for efficient functioning of GST/D.

11. In responding to these comments and observations related to the study, the consultant thanked all the participants for their feedback. He encouraged the CDEMA representative to use her influence and position to continue to encourage more member States to participate in the survey. He also promised this work would continue as part of his professional endeavours once he completed his contractual commitment to ECLAC. He thanked her for her observations on open-sourced applications and indicated that he would update the study accordingly. He agreed with the importance, emphasis and value of detailed attribute tables for the analysis of data. The consultant took the opportunity to inform the meeting that many years prior a common database was created with the support of CDEMA and the Government of Japan and was hopeful that a regional standardized common DRM database would materialize soon.

12. The consultant thanked the SDDU Coordinator for highlighting the challenges they faced in the distribution of the survey and the collection of national responses. He commended the Bahamian focal point for her commitment in gathering and reflecting the national condition in her country's response. His recommendation for a future deployment of a similar survey (an update) should ensure that a national focal point is selected and charged with the responsibility of communicating the national consensus on the application of GST/D.

13. Regarding the question from the UWI representative, the consultant thanked him for his recommendation on standardizing data and shared his suggested approach of formulating memorandum of understandings among agencies. This would facilitate the integration and data sharing at the national level. The consultant also acknowledged his comment on the inclusion of climatic data and would make the necessary amendments.

14. In responding to the colleague from ODPM, the consultant acknowledged that not all countries would require eight computers, as some could function with six depending on their office capacity. But he proposed the GIS application access be extended to other staffers at the ODPM, including the receptionist and the public education officers, furnishing them with the ability to respond to public queries and develop educational products. In the case of the staffing capacity question raised by the ODPM official, the consultant stated it was critical to have at least two officers with GIS training, a Mitigation Officer and a Hazard Mapping Officer.

15. The GIS Analyst, Bahamas National GIS Agency, inquired as to how soon the final study report would be made available to the public. The Economic Affairs officer of the SDDU indicated that the necessary next steps would be to complete the technical review of the study after which it would be subject to the United Nations publications process. He estimated that this would mean a full publication and release to the public domain early in the first quarter of 2022.

16. The CCRIF GIS intern of the Tobago Emergency Management Agency (TEMA) welcomed the exposure and experience. She concurred with the use of open-sourced applications with support and guidance from regional experts on how to access such resources.

17. The Economic Affairs Officer, Economic Development Unit (EDU), ECLAC subregional headquarters for the Caribbean, congratulated the consultant on this benchmarking work in GST/D application in DRM and proposed the opportunity for the utilization of big data, for example river level benchmarks. He suggested the use of drones for the capture of real time data, a method used in ECLAC's most recent Damage and Loss Assessment (DaLA) in Guyana. He was convinced the region needed to move away from reactive responses to disasters and embrace a more proactive approach. In so doing, he

proposed that drones should be deployed on a regular basis to collect data that could be referenced in times of a disaster. Further, he recognized that the region had several talented young people and shared his vision for regional leaders to inspire young minds to innovate and create regional, appropriate and downscaled models to solve our regional development issues. He was convinced that the region should invest in its youth to advance its development.

18. In responding to these comments, the consultant thanked all participants for their interventions, encouraging the GIS intern to reach out to him and other regional experts as she expanded her experience in the field. He was in full agreement with the ECLAC colleague from the EDU regarding the need for real time data, for example during a flooding event drones could be deployed to capture the extent of flooding and the path of the flood waters. He proposed the installation of automated rain gauges capable of relaying information directly to a computer, which would further enhance the national response. The consultant commended the ECLAC representative's point on innovation and youth, agreeing that regional talent was abundant. He shared his intention to host a hackathon aimed at encouraging youth to develop GIS software programmes. He looked towards the regional experts to support this future endeavour. He also noted CCRIF SPC's recommendations offered during the opening session.

19. In answering a question posted in the Webex chat by the CDEMA representative, the SDDU Economic Affairs Officer explained comments from experts will be accepted until the end of October 2021. The ECLAC official took the opportunity to offer some observations related to GST/D, firstly the application of these tools was far-reaching beyond this EGM's focus on DRM. It was apparent to him that the reorientation of Caribbean economies needed to overcome climate change through adaptation could be readily enhanced through the application of GST/D. He noted that spatial analysis was key in resolving these issues, especially in the context of decision-making. There was also the opportunity to apply these tools to the current pandemic in charting the way forward. He referenced the consultant's point on timeliness, it was critical to measure an issue spatially but also to do so in a particular time frame. He thought in examining the use and value of GST/D tools across disciplines could convince the region's politicians of the value to be gained by investing in these tools, systems and the human development that would ultimately guide our overall development.

20. The UWI colleague, shared with the meeting participants recent work carried out by the Food and Agriculture Organization (FAO) in the region which focused on digitizing soil types, through mapping and remote sensing to create data sets. He promised to share these reports with the consultant, as it demonstrated how the work could be expanded. The FAO was carded to explore other areas of work in salinity, land degradation and soil erosion utilizing these tools.

21. The final intervention was provided by head of TEMA, he recognized the work of the disaster management agencies throughout the region and the valuable results gained through the application of these tools. He noted the importance in advocating for increased human capacity within the disaster management agencies to advance their work. He was proud to state that TEMA enjoyed a valuable and longstanding partnership with ECLAC since 2007. At that time ECLAC assisted TEMA with pre-impact data and carried out a needs survey and impact assessment which continues to benefit his organization. He believed it was the responsibility of the regional experts to ensure their employers appreciated the value and relevance of ICT and GST tools. In the aftermath of hydrometeorological events, it is important to understand the level of exposure, therein lies the value of spatial mapping and determining a community's vulnerability. He congratulated all parties on the study and called for the strengthening of national disaster organizations across the region.

22. The Economic Affairs Officer, Sustainable Development Unit, ECLAC, thanked the meeting participants for their interventions.

4. Closing of the meeting

23. In concluding the discussions, the Economic Affairs Officer of the Sustainable Development and Disaster Unit asked participants to consider that GST/D have applications in other economic and social spheres of development, noting that the development of these tools has now made spatial analysis indispensable to a wide range of development decision-making. The meeting concluded at 12.08 p.m.

Annex I

LIST OF PARTICIPANTS

Renee Babb, GIS Specialist, Caribbean Disaster Emergency Management Agency (CDEMA), email: renee.babb@cdema.org

Tremaine Bowman, Intern, Tobago Emergency Management Agency (TEMA), Tobago House of Assembly, email: temaeoc@gmail.com

Elizabeth Emanuel, Technical Assistance and Corporate Communications Manager, Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC), email: technicalassistance@ccrif.org; liz.emanuel@gmail.com

Brett Lucas, GIS Specialist Office of Disaster Preparedness & Management (ODPM), Trinidad and Tobago, email: blucas@mns.gov.tt

Ronald Roopnarine, Lecturer, Faculty of Food and Agriculture, Department of Food Production, the University of the West Indies, St. Augustine Campus, email: ronald.roopnarine@sta.uwi

Suzane Russell, GIS Analyst, Bahamas National Geographical Information System Centre, email: suzanerussell@bahamas.gov.bs

Gina Sanguinetti, Technical Assistance, and Corporate Communications Team, Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC), email: technicalassistance@ccrif.org

Allan Stewart, Director, Tobago Emergency Management Agency (TEMA), Tobago House of Assembly, email: temaeoc@gmail.com

Economic Commission for Latin America and the Caribbean (ECLAC)

Alvaro Monett, Regional Advisor on Geospatial Information Management, Statistics Division, email: alvaro.monett@cepal.org

ECLAC subregional headquarters for the Caribbean (ECLAC)

Dillon Alleyne, Deputy Director, ECLAC Subregional Headquarters for the Caribbean, email: dillon.alleyne@eclac.org

Artie Dubrie, Coordinator, Sustainable Development and Disaster Unit, email: artie.dubrie@eclac.org

Michael Hendrickson, Economic Affairs Officer, Economic Development Unit, email: michael.hendrickson@eclac.org

Willard Phillips, Economic Affairs Officer, Sustainable Development and Disaster Unit, email: willard.phillips@eclac.org

Elizabeth Thorne, Economic Affairs Assistant, Sustainable Development and Disaster Unit, email: elizabeth.thorne@eclac.org

Esther Chong Ling, Team Assistant, Sustainable Development and Disaster Unit, email: esther.kissoon@eclac.org

Jacob Opadeyi, consultant, email: jacob.opadeyi@gmail.com

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