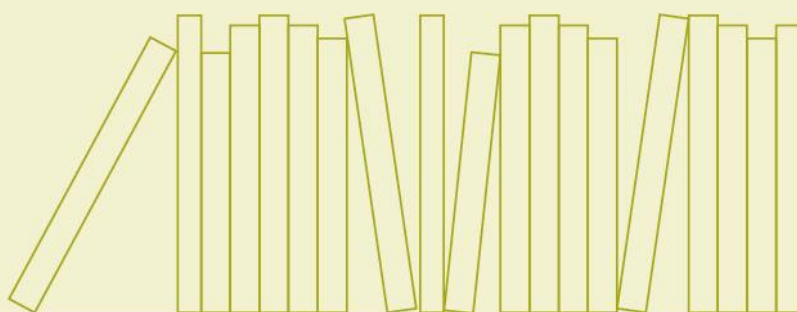


Economic Commission for Latin America and the Caribbean
**ECLAC SUBREGIONAL HEADQUARTERS
FOR THE CARIBBEAN**



Report of the expert group meeting to review a study titled “An assessment of urban expansion in Caribbean small island developing States”

The cases of Jamaica and Trinidad and Tobago



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

Expert group meeting to review a study titled
“An assessment of urban expansion in Caribbean small island
developing States: the cases of Jamaica and Trinidad and Tobago”

Virtual meeting, 8 November 2023

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**REPORT OF THE EXPERT GROUP MEETING TO REVIEW
A STUDY TITLED “AN ASSESSMENT OF URBAN EXPANSION
IN CARIBBEAN SMALL ISLAND DEVELOPING STATES:
THE CASES OF JAMAICA AND TRINIDAD AND TOBAGO”**

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A. ATTENDANCE AND ORGANIZATION OF WORK

1. Place and date

1. The Economic Commission for Latin American and the Caribbean (ECLAC) subregional headquarters for the Caribbean convened an expert group meeting to review a study titled “An assessment of urban expansion in Caribbean small island developing States: the cases of Jamaica and Trinidad and Tobago”. The meeting took place virtually via Zoom on 8 November 2023.

2. Attendance

2. Representatives from the following institutions participated in the expert group meeting: blueSpace - the Caribbean Network for Urban and Land Management, Darmanie Planning + Design, ECLAC - Statistics Division, Habitat for Humanity, Inter-American Development Bank (IDB), Ministry of Economic Growth and Job Creation of Jamaica - Urban Renewal and Development Branch, Ministry of Planning and Development of Trinidad and Tobago - Town and Country Planning Division, United Nations Human Settlements Programme (UN-Habitat), University of Technology, Jamaica and University of the West Indies (UWI) - Department of Geography and Department of Geomatics Engineering and Land Management. A full list of the meeting participants can be found in annex I.

3. Meeting agenda

1. Agenda item 1: Opening of the meeting
2. Agenda item 2: Presentation of study “An assessment of urban expansion in Caribbean small island developing States: the cases of Jamaica and Trinidad and Tobago”
3. Agenda item 3: Discussion and comments
4. Agenda item 4: Conclusion and closing remarks
5. Closure of the meeting

B. REPORTING THE PROCEEDINGS

1. Opening of the meeting

3. The Director of ECLAC subregional headquarters for the Caribbean welcomed all participants online. She explained that the purpose of the meeting was to engage in discussion on the study “An assessment of urban expansion in Caribbean small island developing States: the cases of Jamaica and Trinidad and Tobago”. The Director indicated that the majority of the Caribbean population lives in urban settlements, therefore addressing the unique challenges that these urban areas encounter in the context of climate change must be at the forefront of adaptation efforts of Caribbean small island developing States (SIDS). She noted that the disproportionate expansion of urbanized areas compared to population growth is one of those challenges. To assess that phenomenon, the study under review utilized the methodology of the Sustainable Development Goal (SDG) indicator 11.3.1 to quantify and assess urban expansion in Jamaica and Trinidad and Tobago between 2000 and 2020. It was indicated that the research also employed other secondary indicators to compare urban densities in these two countries with global and regional averages, including other Caribbean SIDS. In closing, the Director expressed her hope that the spatial

analysis conducted by the study could inspire similar analyses in the subregion, supporting governments in bridging the implementation gaps of national and international sustainable development agendas.

2. Presentation of the study “An assessment of urban expansion in Caribbean small island developing States”: the cases of Jamaica and Trinidad and Tobago”

4. In introducing this presentation, the Associate Environmental Affairs Officer showed two satellite images retrieved from Google Earth of the area known as East-West Corridor, Trinidad and Tobago, taken in 2003 and in 2023, and two satellite images of the southeastern border of the city of Montego Bay, Jamaica, taken in 2002 and 2023. He explained that those four images served to illustrate the phenomenon of urban expansion over approximately twenty years in these two countries, the main subject of the draft study under review. The images also illustrated how powerful the use of satellite images and geospatial technology could be in assessing spatial phenomena, therefore being helpful tools for urban planners and policymakers alike.

5. He proceeded to provide the background that motivated the study:

- There had been a significant increase of built-up surfaces in Caribbean SIDS’ urban clusters between 1975 and 2015.
- Sea-level rise was a major threat to Caribbean urban settlements, particularly because a significant portion of the Caribbean urban populations lived in low-elevation coastal zones.
- Combating fast and unplanned urban expansion could be considered an important climate adaptation strategy because that phenomenon increased the climate vulnerabilities of the built environment in urban settlements.

6. Proceeding to the topic of methodologies utilized throughout the research, the officer indicated that three methodological approaches were required to undertake the assessment of urban in Jamaica and Trinidad and Tobago between 2000 and 2020.

7. He indicated that the main framework employed was the methodology developed for the SDG indicator 11.3.1 “ratio of land consumption rate to population growth rate”, also known as land use efficiency (LUE). The calculation of that indicator consisted of the ratio between two other indicators, namely land consumption rate and population growth rate. He illustrated the rationale for the interpretation of that indicator as follows:

- Results above one indicated that the change in the total amount of built-up surfaces was greater than the variation in population in the area considered.
- Results below one indicated that the population increased relatively more than the change in total built-up surfaces.
- Results equal to one indicated that the relative change in total built-up surfaces was equal to the variation in population.

The LUE indicator could also be interpreted against another indicator, the built-up area per capita, understood as the average amount of built-up area each inhabitant occupied in a given area. The calculation of that secondary indicator was useful to draw international comparisons across urban settlements in different countries or for a time series in the same settlement.

8. The Associate Environmental Affairs Officer proceeded with the explanation of the second methodological approach utilized, the Degree of Urbanization (DEGURBA). This methodology was deployed because the indicators described previously were calculated at the urban settlement level and required the delimitation of those areas. Since there were substantial differences across countries on the

criteria for the classification and delimitation of urban settlements, DEGURBA had been formulated to provide that harmonized methodological framework. The first step for the implementation of the DEGURBA methodology was the development of a population grid consisting of cells of one square kilometre covering the entire national territory. This model allowed for the distribution of the national population within these cells utilizing official census information reported at the smallest census unit. In the study under review, the resident population information was distributed over the population grid cells utilizing the built-up area as a proxy for population concentration. The second step for the implementation of the DEGURBA methodology was the clustering of cells, delimitation of settlements, and their classification according to a set of criteria, mainly the settlement's population density and total size. The officer further explained that although the methodology allowed for the classification of several types of settlements, the study under review utilized the settlement types containing the greatest density and size: urban centres and dense urban clusters.

9. The consultant on geospatial data and analysis took the floor to explain the last methodological approach utilized for the completion of the study's goal. The consultant indicated that since countries had not yet completed the 2020 census round, a population projection model was developed to estimate the 2020 population of the areas under assessment at the level of the population grid cell. To develop that projection, the study utilized a population growth estimate at the national level, an estimation of the number of building structures from Google Building Footprints and the average number of persons per household obtained from the 2011 census reports of each country.

10. The consultant proceeded to explain two main limitations of the study methodologies. The first was related to the disaggregation of population density utilizing built surfaces as a proxy, which could underestimate population densities in residential areas in relation to population densities in non-residential areas. The second limitation presented was linked to the process of classification of built-up surfaces. This process could potentially underestimate population densities in areas surrounded by dense vegetation and overestimate population densities in high-density environments or located in colourful land cover.

11. The Associate Environmental Affairs Officer took the floor to outline the study's main findings. In the case of Jamaica, the application of the DEGURBA methodology resulted in the identification of four urban centres as of 2020 – namely: (i) Montego Bay, (ii) Spanish Town, (iii) Portmore and (iv) Kingston – and fourteen dense urban clusters. The officer proceeded to show the calculation of the indicator LUE for the four urban centres in the first decade of analysis (from 2000 to 2010), in the second decade of analysis (from 2010 to 2020), and in the entire period of analysis (from 2000 to 2020). A calculation of LUE at a national level, aggregating the four urban centres population and built-up areas, was also presented. The data produced during the study showed that:

- A general increase in built-up areas had taken place at a faster rate than the population growth in the four urban centres and at a national level.
- The Kingston urban centre had the highest LUE during the 20-year period.
- The Montego Bay urban centre had both the largest increases in population and built surfaces relative to the baseline year of analysis.
- An increase of 21% in built-up areas per capita had happened in Jamaica's urban centres between 2000 and 2020.

12. The officer then outlined the main findings pertaining to the second case study, Trinidad and Tobago. The application of the DEGURBA methodology in that country resulted in the identification of three urban centres as of 2020 – namely (i) East-West Corridor, (ii) San Fernando and (iii) Chaguanas – one dense urban cluster in the island of Tobago, and ten dense urban clusters in the island of Trinidad.

He then presented the results of the calculation of the indicator LUE for the three urban centres and at a national level in the three time periods indicated previously. The data presented showed that:

- A general increase in built-up areas had taken place at a faster rate than the population growth in the three urban centres and at a national level.
- The UC East-West Corridor had the highest LUE value during the 20-year period.
- The UC Chaguanas had both the largest increases in population and built surfaces relative to the baseline year of analysis.
- An increase of 17% in built-up areas per capita had happened in Trinidad and Tobago's urban centres between 2000 and 2020.

13. The Associate Environmental Affairs Officer reported on a comparative analysis of the indicator built-up area per capita utilizing the data produced for the two case studies and global and regional averages for the years 2000, 2010 and 2020. The analysis showed that the indicator's values calculated nationally for Trinidad and Tobago were above the global averages during those three years and were approaching the averages calculated for Northern America and Europe. In the case of Jamaica, the indicator's values calculated nationally were below the values calculated for Trinidad and Tobago and were similar to the Latin American and Caribbean average in 2000. Those values then surpassed the regional average and were relatively closer to the global average in 2020. The officer proceeded to present a comparison of the average built-up area per capita globally and by selected regions, and in urban centres in Jamaica, Trinidad and Tobago, and in other Caribbean SIDS for which data was available.

14. The Associate Environmental Affairs Officer then went on to outline six policy areas that the study findings could be relevant to:

- (i) Climate change and adaptation policies.
- (ii) Development and enforcement of land use control policies in areas surrounding existing urban settlements.
- (iii) Public and private housing policies for intra-urban areas.
- (iv) Provision and costs of services of key infrastructure.
- (v) Geospatial institutional capacities and cross-sectoral cooperation.
- (vi) Access and production of timely geospatial information and statistics disaggregated at sub-national levels.

15. In concluding, the officer noted that during the conduct of the study, additional research questions were raised. These questions could be used as a guide for additional research in this field in the future.

3. Discussion

16. The Associate Environmental Affairs Officer of the Sustainable Development and Disaster Unit invited the designated focal points of the Governments of Jamaica and Trinidad and Tobago to provide their feedback on the draft study before other participants took the floor.

17. The Senior Urban Policy Analyst of the Ministry of Economic Growth and Job Creation of the Government of Jamaica commended the use of data in the research undertaken by ECLAC, whose conclusions could have far-reaching implications for urban development and spatial planning. In reference to the questions for future research presented in the previous agenda item, the focal point inquired whether ECLAC had planned to expand the research to examine the impacts of urban expansion on other urban indicators, such as those related to liveability and economic development. The Associate Environmental Affairs Officer of ECLAC responded that he hoped that the study under review could not only help bridge

a gap in a strategic area of research for the subregion but also inspire other academic institutions to pursue further investigation into the phenomenon of urban expansion. He also noted that the manual of the DEGURBA methodology utilized during the execution of the study and referenced in the presentation brought examples of how the methodology could be employed to spatially disaggregate and localize the monitoring of the SDGs. This exercise could be utilized by national authorities and United Nations agencies to support monitoring and reporting on the implementation of the 2030 Agenda at the local level.

18. The representatives of the Town and Country Planning Division (TCPD) of the Ministry of Planning and Development of the Government of Trinidad and Tobago also commended ECLAC for the work undertaken on urban expansion, expressing the importance of calculating the indicator to assess the expansion of urban settlements. They also indicated that the study under review would be instrumental in the work of the TCPD. They went on to note that the evidence of urban expansion in certain areas of Trinidad and Tobago, as pointed out by the study, could be linked with increased incidences of flooding, unauthorized development and increased submission of development applications. As such, the research highlighted the urgent attention required from planning authorities and the need for a review of the Division's land use policies. In addition, the representatives elaborated that assessing land allocation could be justified not only from a perspective of efficiency, but it could also inform effective measures to cope with the impacts of climate change on urban settlements. In closing their intervention, the Director of the TCPD indicated the singularities of the situation of urban expansion in the islands of Trinidad and Tobago. She highlighted that the urban growth in wide areas of central Trinidad and the city of Port of Spain could be linked with the development of heavy and light industries, large residential populations, and significant land use by commercial activities. This was not the case for Tobago and other Caribbean SIDS.

19. The Associate Environmental Affairs Officer commented on the specific nature of the urban development of Tobago and acknowledged that this illustrates one of the limitations of the DEGURBA methodology, as discussed in the previous agenda item. He indicated that tourism-based economies such as Tobago and other islands in the subregion could expand their urban footprint due to the development of hotels, resorts and other infrastructure of non-residential nature. However, this expansion would not be fully captured by the DEGURBA methodology, because that framework utilized both built-up surfaces and resident population as variables for the classification of urban areas. Therefore, the increase in built-up surfaces alone, as indicated in the draft study, did not directly reflect on the formation of an urban centre in Tobago.

20. The Associate Environmental Affairs Officer then invited other participants to share their insights in relation to the draft study.

21. In responding to the proposals of questions for additional research presented by the Associate Environmental Officer in the previous agenda point, several participants agreed that the implementation of one square kilometer population grid as proposed by the DEGURBA methodology posed limitations for the classification of urban areas in the context of smaller islands. The application of one square kilometer cells following the international methodology allowed for comparability with work developed in other regions, such as the land use efficiency indicator proposed by the Sustainable Development Indicator 11.3.1. However, developing a model that could capture the development of built-up surfaces at a more granular level and more disaggregated population distributions was proposed as an alternative for smaller landmasses and islands where topography favored a more dispersed urban development. In addressing that proposal, the consultant on geospatial data and analysis took the floor to provide additional information on the process of computation of the SDG indicator 11.3.1. He explained that during the process of modeling the data for the study under review, data had been disaggregated at a more granular resolution than that required by the DEGURBA methodology. Built-up surfaces retrieved from Landsat satellite images were disaggregated at a 30-metre resolution and the population information was disaggregated at a 100-meter resolution. The one square kilometer grid was produced to allow for the clustering required to identify the

urban centres and the dense urban clusters, allowing for the comparison with international benchmarks according to the DEGURBA methodology. He also indicated that the study inherited the limitations of the data as sourced. In the case of population data, if the census information had been provided in a one square kilometer grid, the study could have benefitted from better-distributed demographic information to assess urban expansion.

22. In her intervention, the representative of the Department of Geomatics Engineering and Land Management of the University of the West Indies elaborated further on the expected impacts of climate change on urban settlements in the subregion, which were presented under the previous agenda item. She agreed that sea-level rise, a slow-onset event associated with climate change, was expected to affect urban settlements across the subregion. In addition to that phenomenon, she highlighted that coastal cities and inland areas were already experiencing increasing levels of rainfall and flooding, which could be considered a more significant and current impact of climate change in urban areas in the subregion. Therefore, new urban and building development should be accompanied by hydrological modeling and studies assessing flooding patterns, and the costs of appropriate infrastructure should be factored into these developments.

23. The representative of the Caribbean Network for Urban and Land Management called for more specific definitions of concepts such as urban, rural, sprawl, containment, intensification and others. He indicated that the research conducted by ECLAC could have benefitted from engaging with how these concepts had been articulated in local plans developed for certain areas of Trinidad and Tobago, such as Chaguanas, Port of Spain and San Fernando. He also referred to the definitions of urban areas included in the annex of the draft study and questioned whether those indicators of urban population were accurate in describing urbanization in countries such as Antigua and Barbuda, Anguilla and Saint Lucia. The Associate Environmental Affairs Officer stated that the ECLAC study utilized the DEGURBA methodology throughout the analyses of the two case studies and all definitions were included in the methodology manual referenced by the study. However, in order to frame the discussion on the diversity of definitions of urban, the draft study made reference to the World Urbanization Prospects of the United Nations Department of Economic and Social Affairs (DESA), where various definitions of urban were compiled as reported by national authorities. In that study, proxies were utilized to produce an indicator of urban population for some countries where an official definition was not available. In light of a diversity of definitions of urban utilized and the absence of official definitions in some countries, the Associate Environmental Affairs Officer highlighted that the DEGURBA methodology sought to add value by proposing an international methodology that could provide a base for both the creation of a definition where it did not exist or for the update of existing definitions.

24. Two experts asked whether water bodies were considered in the process of calculation of land use efficiency. They explained that this information was important because including those areas in the computation of the indicator could result in a misestimation of population densities. The consultant on geospatial data and analysis explained that the settlement delimitation model utilized only built-up surfaces and population data to produce the densities required for the clustering of cells. The water bodies were ignored as they would have no impact on the modeling and calculation of the relevant indicators. The Associate Environmental Officer also noted that the land use efficiency indicator is not calculated by dividing the extent of the entire urban footprint of a given urban cluster, but rather by dividing the sum of the built-up surfaces by the resident population in an urban area clustered according to the rules set forth by the DEGURBA methodology.

25. Two experts inquired whether the methodologies utilized by the study under review were able to include specific settlement typologies in the process of delimitation of urban areas. The growth of informal settlements was mentioned as an important element in assessing the urban expansion in both Jamaica and Trinidad and Tobago, and one participant questioned whether these settlements were included in the delimitation of urban clusters. The Associate Environmental Affairs Officer highlighted that the

methodology considered all built-up surfaces as identified during the process of data processing, therefore specific settlements were not excluded based on types of tenure, formality status or any other variable.

26. Several experts asked about the causes and drivers of urban expansion in the case studies. One expert questioned whether the urban expansion captured by the analysis was caused by organic dynamics of urban growth or whether it had elements of planned expansion. In that regard, another expert recalled the term “state-sponsored sprawl” employed over the years to denominate the process of urbanization promoted by the construction of certain typologies of public housing that caused the formation of low-density settlements in a decentralized pattern alongside or in the periphery of consolidated urban areas. The expert indicated that this process was widely known in the subregion and had been historically coupled with planning policies that also allowed for occurrence of low-density core urban areas in both Jamaica and in Trinidad and Tobago. Another participant noted that there is a strong correlation between income and land consumption, therefore this could be a possible explanation for the results of the comparative international analysis carried out as part of the study under review.

27. Whilst acknowledging that the discussion to ascertain the causes of urban expansion, the Associate Environmental Affairs Officer indicated that the research undertaken did not address the issue as it had set out to assess and quantify the phenomenon of urban expansion, not its causes. He noted that many of these points could be addressed in future research on this area. Addressing specifically the issue of the correlation between urban sprawl and increasing per capita income, the Associate Environmental Affairs Officer made mention of traditional urban economic theory in which the consumption of land was positively correlated with increasing incomes. Therefore, a more dispersed pattern of urban growth in which households preferred larger properties, leading to the formation of lower-density settlements, was expected in wealthier societies. However, he also indicated there was evidence in the literature that higher incomes were not always deterministic of lower-density urban settlements, in both developed and developing countries. He also made reference to literature that treats urban sprawl as a byproduct of certain transportation, housing, fuel, land use and other policies that have spatial implications on the built environment.

4. Closing of the meeting

28. In closing the meeting, the Sustainable Development Officer of the Sustainable Development and Disaster Unit thanked her colleagues for their work in this important area which was relevant for other Caribbean countries. She also thanked the participants for their valuable contributions, as well as their guidance on the methodological approaches utilized. She noted the additional research questions posed by the experts for future research on the topic.

29. Finally, the Sustainable Development Officer thanked the participants for their contributions and made special mention of the support provided by the Programme Management Assistant and other members of the ECLAC team. The meeting was closed at 12.23 p.m.

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