UNITED NATIONS
ECLAC

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

Fourth Meeting of the High-Level Advisory Committee
Review of the Economics of Climate Change in the Caribbean
Port-of-Spain
14-15 April 2011

LIMITED
LC/CAR/L.331
7 October 2011
ORIGINAL: ENGLISH

REPORT OF THE FOURTH MEETING OF THE HIGH-LEVEL ADVISORY COMMITTEE REVIEW OF THE ECONOMICS OF CLIMATE CHANGE IN THE CARIBBEAN

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CONTENTS

A. DECISIONS AND RECOMMENDATIONS

1. The following decisions and recommendations were adopted:

- Consultants were to continue holding in-country workshops, building capacity and ensuring the sustainability of the project. A new schedule of workshops would be developed based on the status of country reports
- Consultants were to make adjustments to their studies as suggested at the meeting, verifying data, making cross sectoral linkages and recommending key adaptation and mitigation strategies with costs
- Consultants were to construct their Business as Usual (BAU) scenarios as discussed, stating assumptions made and the rationale for those assumptions and standardizing BAU frameworks over sectors
- Where data challenges existed assumptions were to be made, comparator data may be examined for possible use as proxy data and sensitivity analyses employed
- With respect to the treatment of extreme events, the Caribbean Community Climate Change Centre (CCCCC) would be asked to prepare a guidance note, and the Review Team member, Juan Llanes, would circulate the report of the "IPCC Expert Meeting on Detection and Attribution related to Anthropogenic Climate Change"
- Timelines would be maintained, as agreed, in order to support the work of the countries and move the climate change agenda forward
- Results generally indicated that, for all sectors, BAU would significantly impact on GDP as compared with implementing recommended adaptation measures
- Under the A2 scenario, countries might not be as badly impacted as under the B2 scenario
- Countries needed to continue implementing current adaptation strategies and to consider the new ones that had been recommended. One way of obtaining commitment for that would be to utilize the results of those studies in promoting mainstreaming of adaptation and, where applicable, mitigation strategies into national development plans.

B. ATTENDANCE AND ORGANIZATION OF WORK

1. Place and date

2. The fourth meeting of the High Level Advisory Committee (HLAC): Review of the Economics of Climate Change in the Caribbean (RECCC) was convened by the Economic Commission for Latin America and the Caribbean (ECLAC) Subregional Headquarters for the Caribbean from 14-15 April 2011 in Port of Spain.

2. Attendance

3. Representatives of nine member States attended the meeting: Antigua and Barbuda, Bahamas, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago. Four associate members were represented: Aruba, British Virgin Islands, Curaçao and Montserrat.

4. The following United Nations organizations were represented: United Nations Development Programme (UNDP) and United Nations Environment Programme (UNEP).

5. Representatives of the following organizations attended: Association of Caribbean Economists (ACE), Australian Agency for International Development (AusAID), Caribbean Community (CARICOM) Secretariat, Caribbean Conference of Churches (CCC), Caribbean Community Climate Change Centre (CCCCC), Caribbean Disaster Emergency Management Agency (CDEMA), Caribbean Institute for Meteorology and Hydrology (CIMH), Caribbean Policy Development Centre (CPDC), Department for International Development (DFID Caribbean), Inter-American Development Bank (IDB), Inter-American Institute for Cooperation on Agriculture (IICA), Organization of American States (OAS), Organisation of Eastern Caribbean States (OECS), General Secretariat of the Central American Integration System(SICA) and the University of the West Indies (UWI).

3. Agenda

6. The meeting adopted the following agenda:

1. Adoption of the agenda

2. The economic impact of climate change on the:

   (a) Agriculture sector
   (b) Water sector
   (c) Coastal and human settlements and coastal and marine sectors
   (d) Health sector
   (e) Transportation and energy sectors
   (f) Tourism sector

3. Recommendations and conclusions

4. Other matters

5. Closing remarks

C. SUMMARY OF PROCEEDINGS

1. Opening of meeting

7. Welcome and opening remarks were made by Hirohito Toda, Officer-in-Charge, ECLAC Subregional Headquarters for the Caribbean.

8. The Officer-in-Charge welcomed participants to the meeting and reminded them of the significant impact of climate change. He spoke of the progress made with respect to strategies to promote adaptation measures as well as of the challenge posed by regional fiscal deficits. Summarizing the key findings of the review to date, he urged participants to further refine the models presented and develop possible recommendations to governments and development partners for implementation. Highlighting the stronger relationship and enhanced collaboration between regional and international organizations which resulted from the present initiative, he thanked everyone for their contributions and wished the meeting success.

2. Adoption of the agenda

9. The provisional agenda was adopted.

3. The economic impact of climate change on the: (a) agriculture sector, (b) water sector, (c) coastal and human settlements and coastal and marine sectors, (d) health sector, (e) transportation and energy sectors, and (f) tourism sector

10. The first presentation by Michael Witter, Consultant, was on the economic impact of climate change on the agriculture sector in Jamaica. The presentation focused on estimating the likely impact of climate change on the Jamaican agriculture sector considering three of the six crops under investigation, namely sugar cane, yellow yam and escallion under the A2, B2 and BAU climate scenarios. The methodology used in the study was a modified version of the Ricardian model, using crop yield as the dependent variable. A panel-data technique was used, except in the case of escallion forecasts, where time-series techniques were also utilized. The ECHAM and Hadley models were used to project the yield of the three crops for the A2, B2 and BAU scenarios up to 2050. The presentation also provided a number of other impacts on the wider agricultural sector. The study identified and described nine measures that the sector could implement to adapt to climate change.

11. The second presentation by Sharon Hutchinson, Consultant, was on the economic impact of climate change on the agriculture sector in Saint Lucia and Trinidad and Tobago. The presentation highlighted the choice of the commodities, followed by an overview of the methodology used in the study, the estimated losses in yield forecasted for the three chosen commodity subsectors under the BAU, A2 and B2 scenarios, and the results of cost benefit analyses of key adaptation strategies proposed. In the case of Saint Lucia, the study concentrated on the impact of climate change on banana exports and revenue, other crops' (produced primarily for domestic consumption) production and total value of fish landings (ex-vessel). The study for Trinidad and Tobago was based on the green vegetable, cocoa, root crop and fishery sub-sectors. It was noted that in respect of the fisheries subsector for both countries, estimates were made based on work conducted by Pauly (2010) in the "Sea Around Us project". Cost benefit analysis that was presented was conducted on 11 key adaptation strategies for both countries.

12. The final presentation by Claremont Kirton, Consultant, was on the economic impact of climate change on the agriculture sector in Guyana. The presentation focused on the impact of climate change on four of Guyana's main agricultural commodities, sugar cane, rice, forestry and fisheries. In Guyana, the manifestations of climate change would be increased rainfall intensity, the occurrence of droughts, increased atmospheric and sea temperature, and increased salt water intrusion as a result of sea level rise. Several non-climate variables, both economic and technical, were controlled and a simple econometric equation was used to model the impact of climate change on the productivity of the various subsectors. However, the presenter noted that the study focused heavily on adaptation issues, specifically as they related to policy, more so than any of the other three sectoral studies undertaken. Adaptation measures were based on Guyana's National Adaptation Policy and techniques currently used by sugar and rice farmers and those were placed into distinct categories for sugar, rice, fisheries and forestry.

13. In the ensuing discussion, the representative of CARICOM noted the significance of land use patterns in terms of climate change in addition to precipitation and temperature. The representative of Jamaica commented on the challenges faced by the consultants in providing cost benefit analyses of adaptation measures for both Guyana and Jamaica and suggested that the meeting provide guidance in that respect.

14. The representative of Saint Lucia raised concerns that wind and sea level rise were climate variables which had not been adequately addressed in the Saint Lucia study. She questioned the omission

of heat resistant crops and challenged the low ranking of 'mainstreaming of climate change' as an adaptation measure. Additionally, she indicated that drainage had not been addressed, identified land use as an issue and queried the cost benefit of greenhouses.

15. The representative of Saint Vincent and the Grenadines asked for clarification on 'the other aspects of climate variability and climate change' referred to in the study on Jamaica. He also questioned the consistency of approach across studies asking how the lack of availability of data would affect the presentation of results and also what role technology transfer played in increasing productivity.

16. The representative of Antigua and Barbuda informed the meeting that Antigua and Barbuda had been practicing drip water irrigation and rain water harvesting for over 25 years, and could provide expertise in those adaptation strategies.

17. In her response, the Consultant, Sharon Hutchinson, clarified that wind damage was categorised under extreme events and was not modeled as an impact of climate change. However, she indicated that damage estimates would be developed in the next stage of the study. With respect to sea level rise, she explained that she was unable to access the relevant Geographic Information System (GIS) maps, but had referred to the study by Simpson et al which suggested that Saint Lucia would not lose land as a result of sea level rise. While consideration had been given to salt tolerant crops because the threat posed by salt water intrusion would be greater, she stated that the costing of heat resistant crops could also be carried out. She suggested that the assumptions on which her ranking was based should be studied to determine whether or not the rank given to mainstreaming climate change as a recommended adaptation measure was appropriate.

18. The consultant further explained that she did not have the data necessary to determine the cost benefit of greenhouses. She stated that drainage had not been considered, neither had land use, because no data were available for the latter; she observed, however, that the potential for increase in crop yield was marginal, constrained as it was by the land available on small islands. She then explained that the models developed by consultants in the sector would all be dependent on the assumptions made with respect to the BAU scenario, and, as such, consistency could only be achieved on the basis of consistency of assumptions.

19. Michael Witter, Consultant, stated that his study had no implications with respect to land use patterns as it affected sugar cane and suggested that an investigation of the industry as a whole was required for completeness. He identified the other aspects of climate change and variability referred to in his study as, sea level rise, risk of extreme wave action, flooding and water damage, decreasing stream flow and the impact of higher temperatures on the breeding rate of pests as it affected animals and plants.

20. The representative of Grenada expressed her concern that the studies presented suffered from an inadequacy of data and urged that the issue be addressed at the regional level. She also questioned the usefulness and relevance of the agricultural studies for non-participating countries in the region.

21. The representative of the OAS recalled that a more modest scope for the project had initially been recommended in light of the paucity of data, and hoped that the issue would be addressed going forward. He stated that the BAU scenario should not only be interpreted with respect to climate change, but take into consideration labour force trends in Saint Lucia. He identified economic resilience, soil capability and land conversion as issues to be considered when identifying adaptation strategies. He recommended that the studies be culled to present only those elements that were robust and could withstand scrutiny.

22. The representative of ECLAC drew the attention of the meeting to research being done at UWI in bioengineering and biotechnology that was important for determining climate change adaptation

strategies. She noted that the BAU scenario seemed to look better than the A2 in studies presented and asked that more attention be given to locating regional data on the fisheries sector.

23. The representative of ACE highlighted the issue of trade and the possible negative impact of international mitigation strategies, such as carbon footprint labelling, on the competitiveness of regional produce. She recommended that the region take advantage of the opportunities for assistance available in international trade agreements.

24. Responding to the question of the relevance of studies to non participating countries, Michael Witter, Consultant on agriculture in Jamaica stated that an important aspect of the work was identifying methodological approaches and, in that respect, the case of Jamaica was methodologically important. He emphasized that identifying data requirements specific to countries of the region would be key in mainstreaming climate change and monitoring it over the next 100 years.

25. The consultant on agriculture in Saint Lucia and Trinidad and Tobago cautioned that apart from providing a methodology, present studies could not be used to make predictions for crop or livestock sectors in countries that had not been modeled. She explained that the cost of the measures and the availability of expertise in country would determine whether or not recommendations to adopt new technologies were made. With respect to the favourable outlook presented in the BAU scenario, the consultant emphasized that it was the result of the assumptions made and indicated that those assumptions might have to be revisited, possibly incorporating non-climate issues.

26. Claremont Kirton, the consultant on agriculture in Guyana, concurred with the remarks of his sector colleagues and reiterated the importance of considering substitution of crops as well as their modification as an adaptation strategy. He stated that an error might have been made in developing his BAU scenario, and said that it would be reviewed.

27. Eleanor Jones, the consultant on the economic impact of climate change on the water sector of Grenada and Saint Vincent and the Grenadines provided a summary of the studies undertaken in those two countries. The studies determined the impact of climate change on the countries' water sector based on A2, B2 and BAU scenarios by focusing on decadal forecast of water supply and water demand for the three user classes (agriculture, tourism and residential) from 2011 to 2050. Both studies showed a reduction in water supply as rainfall declined over the period, though water demand was expected to increase.

28. Sharri Byron, Consultant, made a presentation on the economic impact of climate change on the water sector of Turks and Caicos Islands. As a water scarce country, climate change was likely to stress the existing water infrastructure and would exacerbate water scarcity and access issues and total water expenditure across sectors was predicted to rise over the forecasted period, 2010-2050. Some emphasis was placed on the results derived from undertaking a cost benefit analysis of the adaptation options outlined under the Turks and Caicos Islands 2008-2010 Medium-Term Socio-Economic Development Plan and the 2008-2017 Socio-Economic Economic Development Plan.

29. In the ensuing discussion, Review Team member, Juan Llanes, corrected the consultant's use of the term 'paying for water' stating that payment was for the extraction costs of water, the value of which was underestimated. He stated that water supply losses would be in the realm of 60%-70% and suggested that it would be less costly to deal with that issue. The point of water recycling needed to be clarified since it was very expensive to use water only once.

30. The representative of CIMH enquired as to the sustainability of the initiatives highlighted in the presentation on Grenada and Saint Vincent and the Grenadines. He noted that the studies dealt with

highly non-linear systems and cautioned that such elements had to be examined carefully. He asked whether or not there were numbers and bounding estimates, coming out of the studies which could be used for policy implementation.

31. The representative of Curaçao stated that water spillage needed to be considered in conjunction with water supply and demand.

32. The representative of the British Virgin Islands noted its similarity to the Turks and Caicos Islands in their heavy reliance on energy, and stated that the future cost of energy under climate change would impact the future cost of water.

33. The representative of Trinidad and Tobago observed that the results of the study on Grenada and Saint Vincent and the Grenadines were unexpected given the projected decrease of precipitation in the region. He questioned whether or not the results for Grenada and Saint Vincent were artifacts, noting that the adaptation option would most likely be a response to greater water demand and not the adverse impact of climate change. He also questioned the assumptions made in the construction of the BAU scenario.

34. The representative of Grenada asked whether or not the study on Grenada included the dependencies of Carriacou and Petite Martinique. With respect to the supply-demand gap in Grenada, she pointed out that only large sources of supply were utilized by the water company, and not smaller springs. She stated that flooding was increasing in frequency and enquired how the consultant intended to treat with it. Commenting that no clear recommendations for adaptation strategies had been made for Grenada comparable to those for Saint Vincent and the Grenadines, she enquired whether or not the initiatives mentioned in the presentation were in fact in existence.

35. In her response, Sharri Byron, consultant, acknowledged the need to differentiate between water services and water supply. While agreeing that the systems were non-linear, she stated that the intention of the consultants was to set out a method that took into consideration the impact of climate change on the public sectors, which, augmented by in country data sets, would be more robust and useful. With respect to water spillage, she reiterated the need to provide incentives through policy and pricing and to strengthen water management capacity. Referring to the energy costs of desalination, she repeated the importance of price, and suggested that in the case of the Turks and Caicos it would not be feasible for price to reflect the cost of water production. She confirmed that her BAU scenario was derived by projecting a trend forward and that the assumptions made were based on reputable data sources. She stated that she felt comfortable that the estimates reflected the lower bounds of the impact of climate change on expenditure.

36. The consultant, Eleanor Jones, responded that infrastructure management and maintenance were key strategies in dealing with water loss and endorsed the need for water recycling through the adoption of integrated water resource management systems. She confirmed that the initiatives referred to in her studies were in existence and sustainable and noted the connection of water leakages to extreme weather events. Managing demand was also identified as a key aspect of adaptation, which needed greater promotion. She confirmed that Grenada's dependencies had been included in the study and that there were clear recommendations for Grenada including sustainable land management in light of the problem of flooding.

37. The representative of ECLAC suggested that all studies address the parameter of 'water quality', and the Turks and Caicos study deal with the issue of salt water intrusion into ground water aquifers. She asked on what quantitative data, the policy recommendations of the Turks and Caicos study were based.

Michael Witter, the consultant on agriculture in Jamaica, highlighted the need for behaviour change as a strategy in pursuit of a sustainable future in the region. He suggested that parallel to the econometric studies being undertaken, there was need to develop perspectives on social, political and cultural issues in order to estimate the costs of and bring out important considerations on how to live in a fragile environment.

38. The representative of Saint Vincent and the Grenadines asked for clarification on the interpretation of the BAU scenario and stated that costs in the alternative scenarios should be made clearer in the studies to guide decision-making.

39. The representative of Saint Lucia stated that studies should provide both mitigation and adaptation costs. She asked why no consideration had been given to disincentives to water use as an adaptation measure and called for studies to indicate time frames for implementing adaptation measures.

40. In her response, the consultant, Sharri Byron, agreed that salt water intrusion was an important issue for the Turks and Caicos Islands and identified the Turks and Caicos Islands Public Sector Programme 2008-2017, as the quantitative data for her policy recommendations which was used to arrive at implementation costs. She cited a study on water and sanitation services in Latin America and the Caribbean from which she extrapolated total societal benefits per capita for the Turks and Caicos Islands, as well as a simulation study which looked at the benefits of adaptation and mitigation strategies in terms of the timing of implementation on the reduction of impact. This, she described as a 'no regrets approach' in terms of building adaptive capacity. She also acknowledged the usefulness of data on the Bahamas for study of the Turks and Caicos as indicated earlier by the representative of the Bahamas and agreed that education was important in adaptation.

41. In her closing statement the consultant, Eleanor Jones, stated that water quality monitoring was a critical element in the process and agreed with the importance assigned to changing behaviour as an approach to climate change in the region.

42. Maurice Mason's presentation on the economic impact of climate change on coastal and human settlements in Barbados and Guyana was based on studies which assessed the potential economic impacts of climate change on coastal and human settlements within the low elevation economic zone of Barbados and Guyana, and included an evaluation of the costs and benefits associated with implementing specific adaptation strategies. It was reported that a large and significant proportion of the countries' populations were located within the coastal zone, placing them at increased risk to sea level rise, the impact of tropical cyclone activity and storm surge. The presentation highlighted that under the A2, B2 and BAU scenarios, the asset exposure would be significantly greater than that of the GDP for both countries, and if the impacts of climate change were realized, the governments would have insufficient funds to repair critical infrastructure and provide assistance to the private sector. In the case of Barbados, preliminary analysis showed that the impact of climate change would manifest as a one metre rise in sea level that could result in a possible loss of between 5-30 metres of beach with 49,000 to 51,000 people being seriously affected. For Guyana, there was a per capita financing gap of approximately US$22,000 in the long term, which could be reduced by up to US$2.5 billion dollars in the long term if the country became a member of the Caribbean Catastrophe Risk Insurance facility (CCRIF).

43. Troy Lorde, Consultant, made presentation on the economic impact of climate change on coastal and human settlements in the British Virgin Islands and Saint Kitts and Nevis. The studies focused on the valuation of coastal and marine services, quantitative and qualitative estimates of climate change impacts on coastal zones including beaches and fisheries, and recommendations of possible adaptation strategies and the costs and benefits of adaptation. Regarding the British Virgin Islands, the coastal and marine sector was valued at US$11.2 billion, making it more than 1,000 times the country's 2008 GDP, while for

Saint Kitts and Nevis, it was US$4,279 million, which was over 700 times the 2008 GDP. The studies estimated the future losses to the coastal zone from climate change by considering the effect of sea level rise and coral reef decline on coastal lands and the effect of a rise in sea surface temperature on coastal waters (coral reefs, sea grass beds and the coastal shelf). Three discount rates were employed to analyze all loss estimates in present value terms. Cost benefit analysis highlighted the adaptation options which had a ratio of more than one.

44. In the subsequent discussion, the representative of Saint Lucia commended the consultant on his treatment of the BAU, noting that a similar interpretation was taken at the International Panel on Climate Change (IPCC) negotiations.

45. The representative of Antigua and Barbuda requested clarification on the measurement of the coastal zone in the study on Guyana. The consultant explained that the Low Elevation Coastal Zone was defined as 10 metres above sea level and the coastal zone as 100 metres from the sea.

46. The representative of the British Virgin Islands asked if, in costing reef acreage, the consultant had factored in the significant portion of reef that was degraded and non-functional, and whether or not the different types of reef had been taken into account. She further enquired if a value had been applied to the critical coastal infrastructure and tourism properties. The consultant responded that the cost of coastal infrastructure was accounted for in the model used, that it was the net reef acreage that had been costed and that the different reef types had not been taken into account.

47. Michael Witter, Consultant, enquired whether or not the relocation of Georgetown had been considered in the Guyana study. Referring to that consultant's interpretation of the BAU scenario, he asked the consultant, Maurice Mason, if it was indexed by current levels of greenhouse gases in the atmosphere or by the rate of increase of those gases and if he had compared results using his method of constructing the BAU and the recommended BAU method of projecting historical trends.

48. In response, the Consultant explained how he calculated emissions in his BAU scenario and stated that a comparison with a BAU based on projecting trends was not possible because there were not enough historical data for the countries studied to arrive at trends. He further expounded on the problems arising out of projecting trends to construct a BAU scenario, referring in particular to BAU scenario results that were more favourable than those for A2 and B2 scenarios. He stated emphatically that because the other scenarios were based on emissions trajectories, the BAU model must also be based on emissions.

49. Consultant, Maurice Mason, explained that the relocation of Georgetown had not been considered because it was not consistent with the policy enunciated in government documents, and noted that a cultural bias against relocation posed an additional constraint. He explained the effects of sea surface temperature on provision services in the coastal zone in Guyana, in response to an earlier query.

50. The representative of CDEMA asked whether or not current adaptation strategies and interventions would have an impact on future scenarios. Consultant, Troy Lorde, agreed that they would and added that in his definition of BAU there would be no adaptation or mitigation, and baseline parameters would continue to grow at the same rate.

51. Responding to concerns expressed by the representative of CDEMA with respect to the studies' approach to adaptation options and current policy, the consultant stated that additional data were needed on the adaptation strategies to be adopted and these would be determined based on further discussion and technical consultations in country.

52. The representative of Curaçao asked if, in quantifying losses in the marine sector, calculations were based on impacts of sea surface temperature or sea level rise. The consultant, Troy Lorde, advised that losses projected for coastal waters were based on a rise in sea surface temperature.

53. The representative of the ACE enquired whether or not it was feasible to relocate the population affected by land slippage in Barbados further inland and suggested that improving drainage systems in low lying areas was a possible adaptation strategy. She advised that the impact on livelihoods of persons in the coastal areas should be examined.

54. In his response, the Consultant Maurice Mason, advised that regarding land slippage, the model employed suggested a decrease in precipitation, reducing vulnerability as a result of heavy rainfall. He confirmed that improved drainage was one of the recommended adaptation strategies and explained that livelihoods based on fishing would be adversely impacted as increased sea surface temperature influenced the migration of fish. However, because of the sea defense strategies adopted, it was expected that employment in the tourism sector would remain the same or possibly increase.

55. The consultant on energy, Abdullahi Abdulkadri, engaged the consultant, Troy Lorde, in a discussion in which he sought clarification on the methodology Lorde used to construct his BAU. He suggested that Lorde's model should be called something other than BAU to avoid confusion in the minds of policymakers and then explained the merits of the econometric approach. Troy Lorde strongly defended his approach stating that his model was explicit while faulty results were being derived using a BAU based on historical trends because the underlying model was wrong.

56. Review Team member, Juan Llanes, explained that BAU was a concept used by business as well as climate change and it was connected to mitigation and not adaptation. Emphasizing that there was no experience using BAU in adaptation, he said that the concept was a complicated one, and called for flexibility, understanding and assistance to consultants in making sense of it.

57. The representative of Saint Vincent and the Grenadines expressed his agreement with the approach taken by the consultant, Troy Lorde, observing that something was wrong with a report that implied that the BAU was the best approach to the future.

58. The representative of Saint Lucia recounted the many discussions held in previous meetings on the BAU and the need for its use to be standardized. She stated that the use of different BAU models by consultants had to stop.

59. The representative of DFID commented generally on the day's proceedings, stating that some good ideas had emerged in individual studies, which she hoped would be used to build other sector reports. The studies were showing a greater range of climate variables, however, consultants were treating as separate the analysis of climate change issues and their ranking as adaptation measures, and those needed to be aligned. Issues to be addressed further were consideration of adaptation with mitigation as well as adaptation on its own, and the co-benefits of mitigation. She urged consultants to articulate their ideas clearly.

60. The representative of CIMH stated that some of the datasets needed by consultants were globally available and expressed the opinion that the studies presented displayed a misunderstanding of science. He suggested that scientists should be more involved in the review discussions to avoid working in silos. He sought to correct misleading statements on the activities of CCRIF that had been made in a presentation.

61. The representative of Jamaica declared his support for the position taken by Saint Vincent and the Grenadines and Saint Lucia on the issue of the BAU, and the approach taken by the consultant, Troy Lorde.

62. The consultant on tourism in Jamaica, Ian Boxill, remarked that much progress had been made by consultants in understanding complex issues. Confirming the input of climate scientists in some of the studies, he urged continued collaboration and applauded the emerging discourse for sharpening understanding of the issue. He observed that results might not be delivered in a manner acceptable to policymakers and findings emanating from studies might not prove to be true, although they might not be false, but the point was to have credible explanations. He emphasized the value of counterintuitive aspects in forcing re-examination of accepted ideas.

63. The representative of ECLAC summarized the day's discussions by sector:

(a) The agriculture sector

- Biotechnology and bioengineering were to be introduced as adaptation strategies
- Cost-benefit analyses to be conducted for Guyana and Jamaica
- The impact of wind damage as an extreme weather event to be analysed for Saint Lucia
- GIS maps to assist in the examination of sea level rise to be requested from Saint Lucia
- Drainage to be addressed in the Saint Lucia study
- Data accessibility and availability were identified as overall challenges
- Economic trends to be included in the agriculture sector studies

(b) The water sector

- The percentage of water supply lost through leakage and spillage to be factored into analyses
- Water recycling to be addressed as an option
- The changing socioeconomic impact on water distribution and supply to be factored in
- Turks and Caicos Islands to use southern Bahamas islands data as proxy where data are unavailable
- Grenada to factor in the availability of water from springs
- Rainwater harvesting to be examined as an option
- Studies were to identify the cost of mitigation and to conduct cost benefit analyses

(c) The coastal and human settlements and coastal and marine sectors

- The difference between Barbados and Guyana in their options to relocate human settlements or rely on natural sea defenses
- That CCRIF parametrics were not recommended for Guyana
- The continued discussions on the BAU scenario.

64. The representative of ECLAC commented that the BAU scenario had been discussed at every meeting since February 2010, that a conclusion would be reached, only for the issue to emerge as a point of discussion at the subsequent meeting. She emphasized the urgency of producing results that policymakers had confidence in and could use in critical negotiations such as the one in December 2011. She advised that it was not too late for consultants to change their input data, because it was impossible to accept BAU as the best scenario and pleaded with them to arrive at a consensus position that would be featured in every report.

65. On the issue of the BAU scenario, Review Team member, Mark Bynoe, stated that the Review Team did not think that there could be a standardized BAU, however, there could be a standard framework on a sectoral basis. It was expected, therefore, that intersectoral studies would have a consistent BAU, a baseline which would indicate what would happen without climate change. He asked consultants to ensure that the assumptions made in developing their baseline were quite clear and noted that the baseline was not an emissions trajectory, but the most important variables for the sector without climate change. As such, he stated, it would be inappropriate to use the A1 scenario. He reminded consultants that even without climate change, governments would face population pressures, a development agenda, climate variability, even changes in weather patterns but these would not be conceptualized as climate change, and that the baseline could be compared with the A2 and B2 trajectories.

66. Responding to a question on the rainfall and temperature figures to be used in constructing the baseline, he advised that average temperature and rainfall figures were to be projected forward and that not only climatic variables, but socioeconomic variables as well, were to be used. He encouraged consultants to experiment with the analysis, trying non-linear or quadratic functions where results from a linear projection appeared to be nonsensical.

67. The representative of Antigua and Barbuda indicated that in some cases the BAU would already include adaptation strategies; the implication for policy initiatives being that the adaptation strategies already employed were adequate. Mark Bynoe noted that within sectors, BAUs would need to be adjusted at the national level, reflecting differences among States, while keeping the framework consistent.

68. The representative of DFID commented on the first day's presentations, expressing concern at the level of completion of some studies, encouraging sharing among consultants and sectors and noting the need for studies to take greater account of all climate-related hazards, seasonal variables and extreme events. While there were good indicators of the key drivers of change emerging from studies, she urged better linking among impacts and ranked options and called for results to be put in context, such as GDP affected. With respect to the difficulties in getting data, she suggested that other studies and research from other countries could be used, applying the necessary sensitivity analysis. She pointed out that emphasis should be placed on the usefulness and soundness of these studies.

69. The representative of Curaçao described the IPCC definition of BAU and stressed the need for studies to clarify their use of the BAU in terms of a baseline. He also noted that the term 'mitigation' meant reducing CO_2 emissions as well as reducing impacts, and therefore clarification of its use was necessary in the studies. The representative of ECLAC requested consultants to document the assumptions made and their justification in their reports.

70. Review Team member, Melissa Felician, elaborated further on the issue of the BAU, expressing the view that some of the difficulties experienced were a result of models not being properly specified as well as the manner in which results were being interpreted, but that work was ongoing with consultants to improve this. Mark Bynoe reminded consultants that they needed to have a good understanding of the variables that impact their sector.

71. Review Team member, Matt Butler, suggested that guidelines on the approach to and analysis of extreme weather events should be given to consultants in the interest of consistency. Juan Llanes advised that such guidance was available in the report of the IPCC Expert Meeting on Detection and Attribution related to Anthropogenic Climate Change.

72. The consultant on agriculture in Trinidad and Tobago and Saint Lucia warned that using average climate data and projecting forward would mean unexpected results for some countries, a point that the

meeting needed to note. The representative of Grenada cautioned against having expectations of the model and attempting to fit results to those, acknowledging that impacts were not expected to be the same in each country. Mark Bynoe stated that while it was not uncommon to have a priori expectations in econometrics, one could not fudge to reach those results.

73. The representative of Aruba made the point that small island States were interdependent with respect to their adaptation efforts. He said that it was important that the studies were logical, with results that could be explained, that they could be used for in country advice, to influence international negotiations and to effect behavioural change.

74. The representative of CIMH questioned if outputs from the exercise were expected to be deterministic or probabilistic and stated the need to be careful in looking at models in an uncertain future. He warned that focusing on internal consistency in models could introduce bias against some models and strongly recommended that studies focus on presenting a range of outputs to feed to decision makers, rather than on narrow inputs.

75. The presentation on the economic impact of climate change on the health sector in Trinidad and Tobago focused on the economic impact of climate change on the health sector in Trinidad and Tobago. The diseases analyzed were dengue fever, leptospirosis, food-borne illnesses and gastroenteritis. In the case of dengue fever, the A2 scenario had the highest level of incidence when compared to the B2 and BAU scenario; while for leptospirosis the A2 and B2 scenarios followed a similar path with the BAU scenario but was significantly lower than the two, post-2016. For gastroenteritis, the BAU, A2 and B2 followed a similar path, with B2 seemingly more stable than the A2. Calculation of the treatment costs for the various diseases up to 2050 for the three scenarios showed that the A2 was expected to cost the State the most and the B2 scenario would cost the least. Modeling also showed that a 1% increase in the percentage of the population with access to improved water sources would reduce dengue fever incidence by 306 cases and a 1% increase in the percentage of population with access to improved sanitation facilities would decrease the incidence of dengue fever, leptospirosis and gastroenteritis by 399 cases, 14 cases and 450 cases, respectively.

76. Elizabeth Emanuel, Consultant, made a presentation which focused on a study of the economic impact of climate change on the health sector in Guyana. A predictive empirical statistical modeling was used to estimate the relationship between climate change and malaria. A cost effectiveness approach was applied in the sector in order to provide an assessment of the direction and magnitude of the costs that the Guyanese health sector could face in the four decades to 2050. The results indicated that the anticipated level of rainfall would have a significant impact on the number of malaria and gastro-enteritis cases that were likely to occur between 2011 and 2050 with the number of cases under the BAU being higher than the number of cases under BAU as under the A2 and B2.

77. In the presentation on the economic impact of climate change on the health sector in Montserrat and Saint Lucia, the impact of climate change was forecasted by projecting the climate change-induced excess disease burden for A2 and B2 scenarios for the period 2010 - 2050, and by estimating the non-market, statistical life-based costs associated with that excess disease burden. The diseases considered were malaria, dengue fever, gastroenteritis/ diarrheal disease, schistosomiasis, leptospirosis, ciguatera poisoning, meningococcal meningitis, and cardio-respiratory diseases. Disease projections were based on derived baseline incidence and mortality rates, available dose-response relationships found in the published literature, climate change scenario population projections for the A2 and B2 IPCC SRES scenarios, and annual temperature and precipitation anomalies as projected by the downscaled ECHAM4 global climate model. Monetary valuation was based on a transfer value of statistical life approach with a modification for morbidity

78. Georgiana Gordon, Consultant, delivered a presentation on the study aimed at determining the economic impact of climate change on the health sector by modeling three diseases of public health importance, dengue fever, gastro-enteritis in children under five years old, and leptospirosis. Two emission scenarios were used A2 and the B2 and the ECHAM Climate circulation models were used, along with a BAU scenario which was developed by extrapolating the trend of historical mean monthly maximum temperature. A Poisson Regression analysis was used to model and predict the number of disease cases into the future (2011-2050) for each emission scenario. The climate variables included in the model were maximum monthly temperature and average rainfall, mean monthly household expenditure on health, per cent households with pit latrine and per cent households with access to potable water were the non-climate variables included.

79. In the subsequent discussion, the representative of Saint Lucia had difficulty taking ownership of the Saint Lucia study because it was so removed from the national agenda. She questioned the choice of diseases studied and was critical of the consultant's failure to visit the country. With respect to the Trinidad and Tobago study, she asked if the capacity of the health sector to respond to changes in demand had been modeled, and what was the effect on the productive capacity of the economy. Relating to the Guyana study she asked if, in costing adaptation measures, the issue of access to vaccines by remote communities as opposed to availability had been taken into account; and whether or not adaptation measures targeting the methodology and approach of the mining process had been considered. The consultant stated that she would consider sustainable mining as an adaptation strategy and revisit the use of mosquito nets as an adaptation strategy based on recalculation at the higher cost.

80. The consultant replied that the capacity of the health sector to respond to changes in demand had been modeled, but not the effect on the productivity of different sectors of the economy, an area which could be recommended for further study.

81. The representative of the British Virgin Islands asked about the studies' consideration of asthma, given its reported increase due to the presence of Sahara dust. The question was also asked whether or not the age factor was taken into consideration in diseases such as gastro enteritis which did not affect a country's GDP. The consultant stated that while the issue of asthma might require institutional level analysis, the age implications of gastro enteritis would be put into the model depending on the availability of disaggregated data.

82. The representative of CARICOM commended the presentations and their referencing of Multilateral Environmental Agreements. He noted that policy mistakes in small economies and heavily indebted countries could be extremely costly and questioned propositions made in the Guyana study that cases of malaria were evenly spread throughout the country and that the market price of mosquito nets was low. He further observed that there was little information in the presentations or available in the region on the productivity of labour and how it was being affected by climate change.

83. The representative of Haiti suggested that to consider both water and health as independent variables in the study on Saint Lucia would produce a skewed result. The consultant indicated that she would convey the comments made to the consultant, and informed the representative of Haiti, that in the study, health was in fact a dependent variable.

84. The consultant explained that because changes had been made in the management of asthma in Jamaica in 2003, with a large recorded increase, modelling in that disease would give spurious results. With respect to gastro enteritis and GDP, she noted that while children under the age of 5 were the subjects, productivity loss would be in terms of caregiver time.

85. The representative of Antigua and Barbuda observed that as a policymaker he would want to know exactly how much more money would have to be spent as a preventative measure based on climate change. He further questioned how significant the diseases under study were when compared to other health issues to justify a significant charge on the budget.

86. The representative of Saint Lucia observed that health was a difficult sector as it had not yet integrated issues of climate change; she suggested ways that the consultant on health could maximise the value of his visit to Saint Lucia and engage the sector.

87. The representative of CDEMA was concerned that the aging population was not considered either in the choice of diseases studied or their impact. He queried the absence of risk transfer mechanisms as an adaptation option and noted the need for critical infrastructure to be addressed by means of codes and standards.

88. The representative of IDB drew attention to the indirect impact of climate change on the health sector through its effect on agricultural production and pricing, the negative impact on food security and the resulting malnutrition in a population.

89. The representative of Aruba, noting that no geographical distribution of gastro enteritis had been presented in the study on Guyana asked if its distribution by income had been considered. In response, the consultant explained that in terms of policy there were several competing disease agendas and although all the sector studies researched infectious diseases, those had a huge potential to destroy economic gains. Referring to the demographic profile of diseases as they impacted aging populations, she indicated that information on diseases, with the exception of gastro enteritis, was not sufficiently disaggregated by socioeconomic status, location or age to allow such an analysis. However, she acknowledged that the methodology in use could be refined and data introduced to the model at a later stage as cross sectoral linkages were made.

90. The presentation on the economic impact of climate change on the transport sector in Barbados and Montserrat focused on the economic impact of climate change on the air and sea transportation subsector in Barbados and Montserrat, using an International Transportation Demand Forecasting Model. The study concluded that both countries were at great risk from climate change which could have significant economic impact on their international transportation sector. For Barbados, the impact for air transportation ranged from US$10,727 million (SRES B2 scenario) to US$12,279 million (SRES A2 scenario) and for maritime transportation impact varied from US$1,992 million (SRES B2 scenario) to US$2,606 million (SRES A2 scenario). In the case of Montserrat, the impact for air transportation varied from US$785 million (SRES B2 scenario) to US$980 million (SRES A2 scenario) and for maritime transportation impact estimates ranged from US$209 million (SRES B2 scenario) to US$347 million (SRES A2 scenario). Recommendations were made that additional studies be conducted to examine in more detail the potential impacts of climate change on the country’s key international transportation assets - international airports and the seaport .

91. The presentation on the economic impact of climate change on the energy sector in Trinidad and Tobago projected estimates of energy consumption under on the BAU, A2 and B2 scenarios for the next 40 years and simulated energy supply under different scenarios of temperature, sea level rise, extreme weather and renewable energy sources susceptibility. The results indicated that climate change, represented by change in temperature, was not a significant determinant of domestic demand for energy, electricity in particular. However, on the energy supply side, sea level rise and storm surges presented significant risk to oil installations and infrastructure. Cost benefit analysis was also performed for mitigation and adaptation options. Among adaptation strategies, those pursuing energy efficiency in the immediate term were found to be highly cost effective.

92. In the brief discussion which followed the presentations, the main points made concerning the transport studies were: there was insufficient differentiation of transportation issues at the domestic level; that consideration of extreme events was absent from the analysis; and that volcanic activity ought to be considered. It was observed that people and goods competed for transportation space and that fact needed to be taken into account in the studies. It was observed that there seemed to be a bias towards tourism in the Barbados study, and that no attention was paid to the impact of climate change on transportation infrastructure located along the coastline. It was further observed that the trends in the Trinidad and Tobago study did not appear to be credible and it was suggested that the BAU calculations should be reviewed.

93. Sandra Sookram, Consultant focused on the economic impact of climate change in the tourism sector in Aruba and Curaçao. Projections of tourism demand from 2010 to 2050 were conducted for the BAU and A2 and B2 scenarios. Apart from temperature and precipitation there are other climate variables that had the potential to negatively affect the tourism sector. The impact of climate change was calculated taking into consideration the cost of sea level rise with respect to loss of beach and shoreline tourism infrastructure (exclusive of hurricane damage), and the cost of coral reef loss due to rising sea levels and temperatures. It was found that under all three climate change scenarios there was a decline in tourist income in both countries. Cost benefit analysis was also performed and presented on mitigation and adaptation options that the tourism sector could adopt.

94. The presentation by Ramon Martin estimated the main economic impact of climate change on the Bahamian tourism sector by examining the impacts on stay-over and cruise ship visitor arrivals, tourism expenditure, tourism attractions losses and other losses in related sectors. That study utilized projections for SRES A2 and B2 from PRECIS model and Artificial Neural Networks methods were used to make the projections. The demand model of visitor expenditure was constructed. Proposed adaptation measures were evaluated through a cost-benefit analysis. The study found that a grand total of more than US$2.4 billion in damage might be attributed to hurricanes and the steady rise in the sea level for the time considered. If projected sea level rise is reached by 2050, between 10-12% of territory would be lost, especially in coastal zones where the main tourism assets are located.

95. The presentation on the economic impact of climate change on the tourism sector in Jamaica was given by Ian Boxill, Consultant. The study provided preliminary cost estimates of climate change (variation in rainfall and temperature), extreme events and sea level rise combined with acidification under the A2, B2 and BAU scenarios over varying time frames ranging from 2010 to 2050. The projections indicated that the economy would incur significant losses under the B2 scenario across all three groups of estimates. Of the three different sets of estimates, the highest level of cost was expected to occur as a result of sea level rise and acidification.

96. The fourth and final presentation of the panel was on the economic impact of climate change on the tourism sector in Montserrat and Saint Lucia.

97. That presentation focused on the likely effects of climate change on tourism in Montserrat and Saint Lucia. The studies quantified the possible changes in the climatic factors and so a tourism climatic index was constructed for each country using historical observations as well as those under the two likely climate scenarios: A2 and B2. For A2 and B2, the countries' key tourism climatic features would decline and negatively impact on the destination experience of visitors. The total cost of climate change for Montserrat's tourism industry was projected to be 9.6 times 2009 GDP over a 40-year horizon. In the case of Saint Lucia, the total cost of climate change for the industry was estimated at be US$12.1 billion (which is 12 times the 2009 GDP) under the A2 scenario and US$7.9 billion for the B2 scenario (8 times

the 2009 GDP), over a 40-year horizon. A shortlist of potential adaptation options selected for both countries and the results of the cost benefit analysis were presented.

98. In the ensuing discussions, the CARICOM representative drew the meeting's attention to a World Bank study of May 2009 which ranked Suriname and Bahamas as highly vulnerable in terms of the impact of climate change. He noted that that the recommendations made in the tourism presentations seemed likely to increase the capital intensive nature of the tourism sector and questioned the sustainability of such an approach.

99. Review Team member, Matt Butler, suggested that there was room for convergence in the demand models employed by the tourism studies and greater consistency in their approach to assets and extreme weather events. He thought that the value placed on coral reefs specific to tourism was too high and proposed more granularity in the policy recommendations made. With respect to the cost benefit analysis, he thought that the figures overstated the impact on the economy.

100. The representative of Curaçao observed that the studies' reference to the 'former Netherlands Antilles' was an incorrect designation which should be corrected. Another representative from Curaçao raised the issue of the correlation between temperature, precipitation and tourism demand and suggested clarification of those parameters.

101. The representative of Montserrat emphasized the need for the consultant on Montserrat to pay an in-country visit and to verify data. He recommended studies done by the Pan American Health Organization/World Health Organization and the Caribbean Tourism Organization which provided good datasets for Montserrat. He identified the following important areas of consideration for the study: the issue of volcanic activity, productivity and the need for weather resistant infrastructure, review of the Tourism Climatic Index (TCI) indication that little land loss had occurred and the implication of plans to relocate the main town closer to sea level. The effect of heavy rainfall in mobilizing ash deposits with its negative impact on coral reefs and the extreme dry conditions which exacerbate respiratory conditions in the population. He made reference to a 2007 study which could assist in determining coral reef value and recommended a concise document in tabular form for presentation to politicians.

102. The representative of Jamaica required clarification on what appeared to be a contradiction in the Jamaica study's cost benefit analysis that indicated negative adaptation benefits in the short term and positive benefits in the long term. Referring to the slow long-term irreversible onsets of sea level rise, he asked whether or not an insurance mechanism was costed for the region.

103. The representative of Saint Lucia commended the approach taken in the study on Jamaica and repeated the caution against use of the term 'mitigation' in the studies on Montserrat and Saint Lucia. On the question of extreme events she made reference to the Cancun Agreement and stated that if costing of extreme events was not included in regional studies, the figures presented would be grossly underestimated. She called, therefore, for a reconsideration of studies to include extreme events.

104. The representative of IDB noted that when analyzing the impact of climate change in tourism it was important to take into account the difference in impact on the high season and on the low season.

105. The representative of ACE commended the consultant for recognizing the important impact of international mitigation strategies such as the United Kingdom's Air Passenger Duty and carbon taxes on tourism in the region. She suggested that these strategies should be considered a variable in tourism models because of their potential to increase the cost of inputs into the sector.

106. The representative of Haiti asked why the price of diesel oil and not jet fuel was used in calculations in the study of the Bahamas. In response, the consultant stated that vessels used 11 different types of oil and he chose to use the price of diesel.

107. The representative of ECLAC agreed with the earlier suggestion to include consideration of extreme events in the studies, but referred to the caution that while there was evidence to support greater intensity of extreme events, evidence was inconclusive on their greater frequency.

108. In her response, the consultant indicated that the correlation between tourism demand and temperature would have to be modelled using micro level data collected in the field, and while studies existed for the Organization for Economic Cooperation and Development (OECD) countries there were none for the Caribbean. She indicated that data on infrastructure in Aruba, such as the number and size of hotels, were outstanding, but as the information became available, intersectoral linkages would be made stronger in the study, allowing for recommendations to be made.

109. The consultant emphasized the difference between weather and climate, and the need for regional governments to be shown the trend of a combination of climate variables that would result in a change that would be less pleasant for tourists, that he said, would require making some assumptions. He stated that it was difficult to project the future from current datasets so there had to be agreement on assumptions to be made, however, all the tourism studies used the same variables.

110. The consultant confirmed that some elements were negative while others were positive in his cost benefit analysis. He indicated that he would experiment further with the model as well as hold further consultations with stakeholders, from whom he expected to get more adaptation strategies. He acknowledged that no costing of insurance for sea level rise had been attempted and reiterated that while there were some differences in approach by consultants in the tourism sector, the critical variables were in use over all the models, allowing for sensible comparisons to be made across findings.

111. The presenter on Montserrat acknowledged and noted the points made by the representative of Montserrat. He indicated that the TCI as used by the consultant was a consistent aspect of his analysis and detailed the elements of the index employed. Referring to a question on transportation in relation to tourism, he stated that local or domestic transportation could be included in services provided at the destination.

112. The representative of Antigua and Barbuda informed the meeting that Antigua and Barbuda had documented a severe increase in the frequency and intensity of extreme events, recording 5 in the past 10 years compared to 2 in the previous 50 years. She recommended that the insurance industry with its sensitivity to risk be consulted, stating that since 1999 insurance rates in Antigua and Barbuda had increased on an average of 300% to 400%. She stressed the importance of providing information on extreme events to policymakers, emphasizing that data existed for Antigua and Barbuda which would be willingly shared.

113. In an exchange on the correlation between temperature and tourist demand, the representative of Curaçao suggested that relationships to other related elements of the economy could be further investigated. The consultant advised caution, noting that the correlation was not linear. The representative of Aruba observed that an important aspect of the analysis must be the difference between the climate in the country that the tourist is coming from and the country being visited, and the changes in climate envisaged in both countries. He stated that the climate in countries from which tourists to the Caribbean were coming would need to be addressed.

4. Recommendations and conclusions

114. In bringing the meeting to a conclusion, the representative of ECLAC observed that the current exercise was one of learning by doing. She urged consultants to continue holding their in country workshops, which had the benefit both of building capacity and ensuring the sustainability of the project. She advised experts to make adjustments to their studies as suggested at the meeting, verifying their data, including in their analyses the key drivers of change and recommending key adaptation and mitigation strategies.

115. She recalled the discussion on the BAU, and the clarification and guidance provided: the need to establish national sectoral baselines, to show that the assumptions made in developing the baselines were realistic, and were not made using an emissions trajectory but with a focus on climate variability; that having constructed the baseline, the A2 and B2 scenarios were to be compared, historical data looked at and socioeconomic variables included; that consultants were to experiment with the analysis of data while being realistic and scientific in their methods, remembering always to state assumptions made and the rationale for those assumptions.

116. Results were to be kept separate from strategies but kept in context, showing authoritatively what informed the strategies and costs recommended. Where there were data challenges, it was suggested that assumptions should be made, comparator data examined for possible use as proxies and the necessary sensitivity analysis employed. It was important to verify the practicality of the proxies used.

117. With respect to extreme events, she noted that even if evidence of greater intensity did exist, frequency remained an unresolved issue. As such, CCCCC be asked to prepare a guidance note on the issue, and Review Team member, Juan Llanes, would be asked to circulate the report on 'Detection and Attribution related to Anthropogenic Climate Change'.

118. The representative of ECLAC reminded consultants that providing adaptation and mitigation costs in their studies was important, because policymakers specifically required such information and that the methodology as well as cross sectoral linkages needed to be further developed in the studies.

119. She noted that the meeting had facilitated relationship building between technical experts and country representatives, and reminded participants that the countries would own the reports and as such, needed to have confidence in them to use them in negotiations. She advised that when finalized, reports were to be sent to the countries for endorsement, countries were required to give feedback within one week, and reports were to then be edited, printed and re-submitted. She emphasized the importance of maintaining the timelines set out in order to support the work in country and move the climate change agenda forward.

5. Other matters

120. The representative of Saint Lucia informed the meeting that two important meetings would be taking place in June 2011. The Pilot Programme for Climate Resilience meeting in South Africa on 26 June and the United Nations Climate Change Conference, Subsidiary Body for Implementation in Bonn, Germany.

6. Closing remarks

121. The representative of DFID, in making closing remarks, commented on the different types of economic climate change models that had emerged and encouraged consultants to make their reports stronger by using the right variables and trending lines. She commended the project for its potential to

inform planning for low carbon resilience in the region, and the entrenchment of relevant models on an institutional basis, thus affording sectoral ministries appropriate data and tools.

122. She noted that several good adaptation measures had been identified and the CCCCC already had evidence of successful adaptation in the region. It was important for studies to identify effective approaches that were cost effective, feasible and applicable across a range of uncertain futures. She emphasized the importance of finalizing reports and encouraging cross sectoral linkages and a harmonized, standardized approach. Thanking all involved for a productive and useful encounter, she acknowledged that the production of 24 sectoral reports was a significant achievement and an incursion into the economic analysis of climate change in the region.

123. Referring to the need for more evidence and data sets to improve the robustness of studies, the representative of DFID informed participants that on 3-5 May 2011, a meeting would be held in Saint Lucia to discuss the Regional Resilience Implementation Plan, with one day dedicated to research issues.

124. In her closing remarks, the representative of ECLAC stated that in June 2011 ECLAC would convene a meeting to look at the draft climate change policy, and that the output of the project's studies would be used to inform the regional climate change plan. In bringing the meeting to an end, she thanked the Review Team for their voluntary participation and DFID for its support to the region.

Annex I

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Annex II

List of documents

1. A review of the economic impact of climate change on the agriculture sector in Guyana.
2. A review of the economic impact of climate change on the agriculture sector in Jamaica
3. A review of the economic impact of climate change on the agriculture sector in Saint Lucia
4. A review of the economic impact of climate change on the agriculture sector in Trinidad and Tobago
5. A review of the economic impact of climate change on the energy sector in Trinidad and Tobago
6. A review of the economic impact of climate change on the coastal and human settlements sector in Guyana
7. A review of the economic impact of climate change on the coastal and human settlements sector in Barbados
8. A review of the economic impact of climate change on the coastal and marine sector in British Virgin Islands
9. A review of the economic impact of climate change on the coastal and marine sector in Saint Kitts and Nevis
10. A review of the economic impact of climate change on the health sector in Guyana
11. A review of the economic impact of climate change on the health sector in Jamaica
12. A review of the economic impact of climate change on the health sector in Montserrat
13. A review of the economic impact of climate change on the health sector in Saint Lucia
14. A review of the economic impact of climate change on the health sector in Trinidad and Tobago
15. A review of the economic impact of climate change on the tourism sector in Aruba
16. A review of the economic impact of climate change on the tourism sector in Barbados
17. A review of the economic impact of climate change on the tourism sector in Curaçao
18. A review of the economic impact of climate change on the tourism sector in Jamaica
19. A review of the economic impact of climate change on the tourism sector in the Bahamas
20. A review of the economic impact of climate change on the transportation sector in Barbados
21. A review of the economic impact of climate change on the transportation sector in Montserrat
22. A review of the economic impact of climate change on the water sector in Grenada
23. A review of the economic impact of climate change on the water sector in Saint Vincent and the Grenadines
24. A review of the economic impact of climate change on the water sector in the Turks and Caicos Islands