

Formulating Public Policies for the Sustainable Use of
Natural Resources: the case of Biofuels
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**REPORT ON FORMULATING PUBLIC POLICIES FOR THE SUSTAINABLE USE OF
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REPORT ON FORMULATING PUBLIC POLICIES FOR THE SUSTAINABLE USE OF NATURAL RESOURCES: THE CASE OF BIOFUELS

Introduction

The movement towards the use of alternative energy supplies has been energized through the introduction of biofuels and development of this sector in the Caribbean. There is therefore tremendous interest by policy makers in developing the biofuels sector with a view to reducing dependence on fossil fuels and addressing climatic concerns through the employment of cleaner sources of energy. Interest in biofuels has therefore brought with it the need for development of appropriate policy and, more importantly, the necessity for training of policy makers. Despite the improvements achieved with the reforms for the functioning of energy systems (improvements in productive efficiency, higher investments for supply expansion, less discretion in price formation) with respect to the contribution of energy growth, there is still a series of major challenges for energy policy that is pending, especially with respect to its social and environmental dimensions for the sustainable management of energy resources and to perfect regulatory mechanisms and public policy-making processes. The workshop was convened on 12-14 November 2007 at the Economic Commission for Latin America and the Caribbean (ECLAC) Subregional Headquarters for the Caribbean as part of the programme of support of ECLAC to Caribbean Development and Cooperation Committee (CDCC) member countries in an effort to introduce methodologies and tools to empower policy makers so that with the development of the biofuels sectors in the countries the necessary policies would guide such development.

Agenda 1 Welcome remarks

Mr. Neil Pierre, Director, ECLAC Subregional Headquarters for the Caribbean, extended a warm welcome to the delegates of the eight ECLAC member countries attending the training workshop and to the consultants and experts present. He remarked that the workshop was aimed primarily at national authorities involved in policy-making and who either had an interest in the development of biofuels policies or currently were in the process of developing such policies. He highlighted the significance of this workshop in the context of reducing the dependency of Caribbean countries on fossil fuels. He reminded the audience that the role of ECLAC was to provide assistance to member countries for exploring the various alternatives to using fossil fuels, as part of a strategy aimed at reducing dependence on fossil fuels. While a range of options existed among alternative sources of energy, ranging from solar, wind to geothermal energy, the role of ECLAC was to present biofuels as one such option and to analyze the feasibility of these various options for the Caribbean. He stated that there was currently debate taking place at a global level regarding the impact of biofuels, especially as it related to food prices and food security and competing land uses. It remained for national countries in the final analysis to establish their own national priorities in terms of energy options in line with their own national specificities, such as availability of land and state of technology. The Director renewed the interest of ECLAC to be a reliable partner in working with national member countries and

providing them with the best possible technical and objective advice, guidance and tools for implementation.

Mr. Manlio Coviello, Regional Expert on Energy, ECLAC Headquarters, Santiago, Chile, added introductory remarks. He stressed that there were no unique recipes for reducing dependency on fossil fuels and that the role of ECLAC was mainly in proposing ideas and presenting the options available. He then invited participants to from Barbados, Guyana, Jamaica, St. Kitts and Nevis, Suriname, the United States of America and ECLAC to introduce themselves. Professor Augusto Horta, Consultant, reminded the audience that there were different kinds of bio-energy and informed that he was working with ECLAC on pre-feasibility studies in a few Latin American countries concerning bio-energy use.

Agenda item 2

Adoption of the agenda and organization of work

The agenda proposed was unanimously adopted without objections. The representative from Barbados queried whether the workshop would look into opportunities for synergy at a regional level and the role that the Caribbean Community (CARICOM) would play in terms of regional collaboration. The Director of ECLAC clarified that CARICOM had been invited to the workshop but, unfortunately, could not send a representative and that CARICOM was involved along with ECLAC as a partner in the area of biofuel development. The representative of ECLAC Headquarters also clarified that Day 3 of the workshop would centre on regional policy and the need to coordinate a common regional agenda. The Director Pierre interjected that national efforts should be placed within a larger regional strategy. Professor Horta and Mr. Cesar Chavez, Consultant, were introduced to the participants, the first as a world-class expert on biofuels and the second as an ECLAC consultant who would moderate the workshop. It was also pointed out that in the past ECLAC, the Latin American Energy Organization (OLADE) and the German Agency for Technical Cooperation (GTZ) had jointly produced a Blue Book on Energy which involved case studies for more than 60 countries, including Jamaica. ECLAC wanted to take advantage of this experience and, after integrating a sustainable development focus, adopt the philosophy used in that work to the case of biofuels. For pragmatic reasons, agenda item 3 on Workshop Methodology was postponed to a later stage and the next session centred on country–case studies presented by country representatives. These country case studies were meant to highlight Caribbean national experiences in biofuel policy development, especially the current strengths, weaknesses, opportunities and threats (SWOT) posed by biofuel production in such countries.

Agenda items 4 and 5

National biofuels scenarios and challenges faced in the development of this sector

The representatives of the following six countries delivered presentations: Barbados, Guyana, Suriname, Jamaica, St Kitts and Nevis and the United States. The presentations prepared by Trinidad and Tobago and the Dominican Republic were delivered in the absence of their representatives.

In the Barbados country case study, it was pointed out that Barbados had limited on-shore mineral and hydrocarbon resources, which had been efficiently exploited over the last few decades. Offshore resources had considerable potential, with an offshore license area of approximately 43,000 km² (18, 532.9 miles²). Barbados was currently aiming at mitigating the impact of high oil prices and had adopted a series of measures in this context that included: the increased exploration for and equitable exploitation of onshore and offshore oil and gas resources; diversification of the fuel mix with a transition to natural gas as the primary fossil fuel (it is anticipated that the fuel mix will be 70 per cent natural gas by 2026); a comprehensive energy conservation and energy awareness programme; and reduced dependence on fossil fuels by the promotion of renewable energy. Renewable energy targets have been set as follows: 10 per cent of national energy usage will be from renewable sources by 2012, and 20 per cent by 2026. As part of biofuel development, the government was planning the construction of a 30 MW co-generation plant as a component of the Cane Industry Restructuring Project (CIRP) by 2010. The feasibility of a second biofuel project using energy crops would be investigated. The standard of 10 per cent ethanol in gasoline would be implemented and the content of ethanol in gasoline would be progressively increased over the next 20 years as more ethanol feedstock became available. The government was also considering mandating a 2 per cent bio-diesel content in all vehicle diesel fuels by 2012, to be increased to 10 per cent by 2025. A SWOT analysis of ethanol, bio-diesel and biogas was presented. It was pointed out that as oil prices hovered close to \$100 a barrel, it was becoming increasingly urgent to find timely and sustainable solutions and that such solutions would be achieved through a combination of energy-saving measures ranging from energy conservation to the increased use of various renewable sources including biofuels, such as ethanol and bio-diesel. At the end of this presentation, the representative of ECLAC Headquarters emphasized that the Barbadian position was in accordance with that of ECLAC, namely in viewing biofuels as one option in a possible mix of energy options.

In Guyana, fuel needs were met primarily through petroleum imports, use of mogas and gasoil. The government currently had a draft biofuel policy that incorporated components such as research and development, government policy and regulations, investment strategies and public-private partnerships, training and the need to balance the energy portfolio. The presentation described ongoing biofuel projects, namely a green field project that would involve the cultivation of 50,000 hectares of crops for biofuel production; an ethanol project funded by the Canadians to look at sweet potatoes as feedstock and the commissioning of the building of a bio-diesel plant to look at prospective use of African palm oil, physic nut and jatropha as biofuel feedstocks. The current obstacles and limitations to biofuel development in Guyana were listed and these included financing for heavy capital investment as well as training and a need for government policies and regulations. The benefits were described and these included foreign

exchange savings, reduction of greenhouse gases emissions and creation of jobs, among others. It was stated that the Government of Guyana was pursuing the production and use of biofuels as part of an overall sustainable development path for the country that would center on promotion of economic growth combined with reduction of poverty and environmental protection. The development of renewable sources of energy was an important means of achieving these goals. It is to be noted that agro-energy/biofuels is one of the renewable sources of energy being considered along with solar, wind and hydro energies. Guyana possessed advantageous conditions for the effective development of agro-energy (positive factors included equatorial climatic conditions, availability of vast tracts of arable land, abundant water resources, low population density and a culture of agricultural production). Mention was made that the Government of Guyana had approached ECLAC for the conduct of a study to examine the potential for the production and use of biofuels. Appreciation was expressed for ECLAC's prompt response and support in implementing that study, and for the financial contribution of the Government of Italy. The contents of that study were reviewed by the presenter. Ongoing initiatives in relation to the development of agro-energy were also reviewed. Notable facts included, inter-alia, the setting-up of a special committee by the President of Guyana to oversee the development of agro-energy in Guyana and the preparation of a Guyana Agro-Energy Portfolio Strategy by that committee to provide a roadmap for the development of a competitive and sustainable agro-energy sector in Guyana, through targeted research and development, training, institutional enablement, technology transfer and investment. Several investment proposals were under way (namely three proposals for ethanol production from sugar cane, three for bio-diesel production from palm oil, one proposal for e-grass production for electricity and one proposal for co-generation from bagasse). It was expected that ECLAC would provide support for the evaluation of these investment proposals. The representative noted that the Government of Guyana recognized the strong debate in relation to the impact of biofuels on food security and, as such, was committed not to take lands away from farming and not to pursue deforestation for biofuel production. It was recognized there was a need for international and regional development banks to offer low-interest loans to encourage investments in the biofuel sector.

In Suriname, 85 per cent of the surface area of the country was still under tropical rainforest. The vast availability of land, sunlight and water along with an appropriate climate for agri-resource materials for biofuel production were among the positive factors for potential biofuels development in that country. The negative constraining factors included, among others, the lack of governmental regulations, policies and incentives for biofuel production; weak specific research and technology support, inadequate transport infrastructure; lack of manpower and bureaucratic problems. Opportunities lay in the potential for attracting international support and consulting skills and expertise; the potential for improving land use and bringing unexploited land into culture; and reducing energy imports, to cite just a few. Threats posed revolved around the dangers that forests might be removed to make way for biofuel crops production and for the country to engage in mono-cultural practices. Support from ECLAC in developing rules and regulations for a biofuel policy were requested by the representative.

The representative from Jamaica outlined the current situation in biofuel production in that country. There were three plants in Jamaica that currently exported fuel ethanol to the United States under the Caribbean Basin Initiative (CBI). Jamaica's ethanol exports amounted to

79.3 million gallons in 2006 compared to 30.4 in 2004. In its National Energy Policy Green Paper (2006-2020), the Government of Jamaica set clear targets for renewable energy sources in total energy use (10 per cent by 2010 and 15 per cent by 2020). In November 2006, a Center of Excellence for Renewable Energy was set up in order to stimulate research, development and collaboration in that area. The National Energy Policy encourages the use of biofuels and ethanol blends as part of its goal of promoting social equity and environmental sustainability. It also stipulates policy and regulatory incentives such as duty and tax exemptions on use of biofuels technologies. It incorporates an ethanol blending mandate that lays out minimum percentages of ethanol to be added to petrol and a mandate for minimum percentages of bio-diesel to be mixed with diesel by 2010 and 2020. Bio-ethanol was earmarked for transportation energy needs and local feedstock sources were mainly sugarcane and cassava. Local feedstocks for bio-diesel production were castor, palm, jatropha, sunflower and rapeseed and the Government of Jamaica has struck a partnership with the Republic of Brazil for securing technical assistance and support in that area. The SWOT analysis for Jamaica revealed that Jamaica's major strengths in biofuel production lay in its assistance programme with Brazil, land availability, experience and capacity built in ethanol production and the availability of an energy policy providing clear goals and focus, among others. Weaknesses were to be found in limited local expertise in plant types and chemicals and limited local public awareness to biofuels as an alternative fuel. Difficulties were also faced in the coordination of market logistics. Opportunities presented included employment opportunities for local farmers, development of public-private partnerships and development of research sector in biofuels. On the other hand, inadequate financial investment, among others, could threaten these opportunities. The representative did, however, emphasize that authorities in Jamaica saw more opportunities than threats and weaknesses when it came to biofuel production. Mention was also made of efforts being deployed in Jamaica to incorporate learning about biofuels in school curricula as part of public education and national marketing development programmes and of efforts to build national integrated models for economic viability (e.g. use of Biosoft).

St. Kitts and Nevis, in contrast to Jamaica, was presently considering developing any potential it may have in biofuels. A major opportunity lay in the closure of its sugar industry as a result of changes to the European Union (EU) sugar regime and the consequent availability of sugar lands. Several investment proposals were made for alternative economic uses of these lands including using the lands for ethanol and other biofuels production. The Government of St. Kitts and Nevis has approached the Organization of American States (OAS) and the United Nations for technical assistance in exploring the potential for bio-energy and a study to that effect has been completed. The study concluded that St. Kitts and Nevis could, under certain conditions, generate electricity and produce ethanol for local markets. Following this study, St. Kitts and Nevis was selected to be one out of four CBI countries to benefit from the United States/Brazil Biofuels Partnerships Outreach Program. It has been agreed that the biofuels industry in St. Kitts and Nevis will rely on a diversified sugar industry. Strengths of the biofuel sector reside in public land ownership and local experience in sugar cultivation. Land scarcity, limited availability of local labor and high production costs constitute weaknesses. The sector could present opportunities for rural community development, technology transfer and fuel security as long as threats posed by competition for land, institutional inability and difficulties to attract and retain trained local staff are contained.

Trinidad and Tobago did not have a biofuel policy though there were plans to remedy to this limitation in the future through the drafting of an official energy policy that would include renewable energy (and biofuels) development. The expected fast depletion of Trinidad and Tobago's oil and gas reserves implied that a shift to renewable energy sources needed to be considered urgently. It was to be noted that currently Trinidad and Tobago exported purified ethanol to the United States. Overall the major weaknesses for biofuel production in Trinidad and Tobago lay in the fact that there were no production incentives for it given how relatively cheap diesel and gasoline were to its users. In addition, there was a lack of biofuel resources, the sugar industry had been closed down and sugar cane was no longer available as a biofuel material. However the finiteness of petroleum as a resource should give authorities an incentive to consider the potential of renewable energy sources and this presented an opportunity. A possible threat to this possibility might come from the need to convert agricultural land from food crop production to biofuel production and thus raise controversy regarding food security and food prices. Moreover there would be a need for capital investment and public education on the benefits of biofuels. While Trinidad and Tobago should urgently consider renewable energy development, the political will in that direction remained to be enhanced.

In the Dominican Republic, the electricity sector had a high rate of technical and non-technical losses, amounting to as much as 29 per cent of electricity generation. The difficulties of that sector led to interest in developing biofuels for use. The government, through the National Energy Commission, carried out research projects to study the yields of various biofuel crops for energy production and there were 11 biofuel projects being implemented throughout the country. Interest by foreign investors was significant. The country has available about 300,000 hectares of land for ethanol production and 400,000 hectares for bio-diesel production, for a potential energy production amounting to 40 per cent of actual energy demand.

The representative from the United States Government presented the major goals of the United States energy policy. A major plank of that policy was to engage with allies, producers, consumers and non-governmental organizations, both bilaterally and multilaterally, in order to, among others, diversify sources of energy supply and suppliers to the United States as well as promote energy efficiency and conservation. In 2007, President Bush in his "State of the Union" address articulated the need to reduce use of gasoline in the United States by 20 per cent over the next 10 years. This aim was to be accomplished through the setting of a mandatory production of 35 billion gallons of alternative and renewable fuels by 2017 and the setting of fuel economy standards for cars and light trucks. The representative of the United States highlighted that the United States faced energy challenges and vulnerabilities that were common to those faced by the Caribbean countries (such as economic impact of high oil prices and public dissatisfaction, uncertainty in oil markets, instability in oil-producing regions, high dependence on oil). He discussed the impact of high oil prices on small island import-dependent economies and added that the United States supported the Caribbean and other countries in its efforts at producing and consuming biofuels, while recognizing that each country would need its own set of legislative reforms and incentives to develop that sector. Such support can be seen for instance, at a bilateral level, in the form of university exchanges programmes and visits between Brazilian scientists and the United States Energy department and agricultural laboratories. At a regional level, it was manifested in United States technical and financial support for biofuel production and consumption in developing countries (e.g. Haiti, Dominican Republic, El

Salvador and St. Kitts and Nevis) in partnership with the Inter-American Development Bank (IDB), the OAS and the United Nations Foundation. At a multilateral level, the support was evident in working together with countries such as Brazil, China, India, South Africa and European Commission countries via the International Biofuels Forum to commoditize biofuels for commerce. He stated that the goal of the United States Government in this hemisphere, especially for small economies, was to promote energy diplomacy and cooperation. He also mentioned that in March 2007 a Memorandum of Understanding was signed between Brazil and the United States in the area of biofuel development.

Agenda item 6

Biofuels policy in Latin America and the Caribbean: the ECLAC perspective

The representative of ECLAC Headquarters gave an overview of the biofuels policy in Latin America and the Caribbean. The first part of the presentation provided a snapshot of the production and use of biofuels worldwide. Brazil emerged as the leader in biofuels use for meeting road transportation energy consumption (more than 12 per cent compared to less than 2 per cent for the rest of the world), followed by Cuba and Sweden. These percentages were expected to climb to about 28 per cent for Brazil and about 8 per cent for the world by 2030. The second part of the presentation examined the potential for biofuels production in Latin American and the Caribbean. According to projections made by the Intergovernmental Panel on Climate Change (IPCC) for 2050, Latin America and the Caribbean was the region with the largest “technical” energetic potential from energy cultures behind Africa. Within Latin America and the Caribbean, Cuba and Argentina had the largest percentages of ethanol mix in fuel consumption (based on net production surplus figures) and in the Caribbean the lead was held by Barbados. Argentina and Bolivia had the largest percentages of bio-diesel mix in fuel consumption. Brazil, Argentina and Paraguay had the highest potential for expanding their agricultural frontiers to support ethanol production from either corn or sugar cane, and in the Caribbean the leaders were Suriname and Guyana. For bio-diesel production, leaders in terms of agricultural potential were Brazil, Peru, Colombia, Bolivia, Guyana and Suriname. The next section of the presentation dwelled on the market potential for biofuels in the Latin America and Caribbean region. It was noted that in general diesel consumption had been rising in the region, though intraregional variations existed. Use of diesel oil was predominant in Central America and the South Cone while in the Andean and the Caribbean regions, gasoline dominated. The rise in gasoline consumption had been noticeable of late in the Caribbean. While the market potential for E10 and B10 was huge in Latin America and the Caribbean, even if fully reaped, such potential could account at best for only about 4 per cent of total road transportation energy needs and 1 per cent of total energy consumption needs, thereby clearly signalling that biofuels could never be “the” solution for meeting energy needs in the region, but could only be at best a part of the solution for diversified energy sources. In terms of projected demand for and maximal production of B10 and E10 until year 2020 relative to land availability to support such demand, it was noted that countries on average might require about 9 per cent of their arable land to be converted to biofuel crop production in order to allow such projected demand for B10 and E10 to materialize over the next 13 years. The figures could range as high as 55 per cent for Trinidad and Tobago, 38 per cent for Chile and 32 per cent for Colombia, thereby indicating that fully reaping the maximum potential for E10 and B10 production and use might not be desirable and

feasible to start with when weighed against the impact on agriculture. The remaining sections of the presentation focused on the unit costs of producing ethanol and bio-diesel (the costs of producing ethanol depended on the price of sugar cane and, in this area, Brazil was the most competitive; for bio-diesel, costs of production were linked to costs of various oilseeds used as feedstocks). The presentation also looked at the next advanced, second-generation biofuels and their costs of production. Bio-oil was mentioned as presenting great potential as it could be generated from more than 120 different sources of biomass. Carbon credit markets were analyzed and sectoral project distribution within the Clean Development Mechanism (CDM) Initiative was looked at. It was noted that out of 812 projects registered to date through the CDM and approved to issue carbon credits, only one related to a biofuel project. This was the “Biolux Benji Bio-diesel” project in Beijing that aimed at producing bio-diesel from waste cooking oil. In this respect, it was concluded that the CDM was not succeeding at stimulating use of biofuels as a source of renewable energy. The presenter closed his presentation by describing two ongoing biofuel projects, namely the above-mentioned “Biolux Benji Bio-diesel” project from Beijing, China and the “GUYSUCO ethanol” project in Guyana.

This session comprised three presentations. The first focused on biofuels policy in Latin America and the Caribbean, the second on the Brazilian experience in Biofuels, and the third on how to formulate public policies on biofuels.

This presentation was delivered by the representative of ECLAC Headquarters and focused initially on the global situation of oil demand, price of oil and development of the biofuels sector. The Latin American and Caribbean situation was then addressed. This showed the availability of biomass energy in the region, the consumption of a fuel mix where it was apparent that Cuba and Argentina produced a net surplus of such energy. The biodiesel mix showed that Argentina and Bolivia had the largest net surplus biodiesel mix. The relative yield of biofuels from different feedstock in terms of the optimal level that was available was presented, with soya bean in Argentina and sugar cane in Brazil being the richest sources.

The market potential for biofuels in the Latin America and Caribbean region was examined with demand being greater for bio-ethanol (E120) than biodiesel (B10) in the transport sector. This situation was also true for the Caribbean. An examination of the potential market for each of these was presented with bio-ethanol having a slight advantage over bio-diesel. The costs of bio-ethanol and bio-diesel were stated using different feedstock, and sugar cane seemed to provide the highest yields. Second generation biofuels such as eucalyptus were also featured in terms of yield.

The contribution of biofuels to climate change was then addressed through an examination of the CDM and carbon trading. It was stated that, to date, the CDM had not been very effective in reducing carbon emissions. An example of one such project in China was presented. However, the impact of the introduction of biofuels on the Guyanese market was provided with significant reduction on oil imports and carbon emissions.

Agenda item 7

Biofuels in Latin America and the Caribbean: the Brazilian Experience

This presentation was made by ECLAC consultant, Professor Luis Augusto Horta, and focused on the modality of developing the biofuel sector in Brazil. This dated back to 1931 and sought to reduce dependence on fossil fuels while boosting the agricultural sector. Over the years, the percentage of bio-ethanol in gasoline blends had increased with sugar cane being the main feedstock. The fermentation and purification process of producing ethanol from sugar cane was described and the contribution of bagasse as a waste product was explained. Professor Horta also focused on the growing market for bio-diesel in Brazil. The final points to be considered showed the difference in yield between ethanol and bio-diesel; the impact of feedstock on final results; whether or not the production model was labour or capital intensive; the purpose of developing the biofuels sector in the Caribbean (trading of national market); and the governments' roles in promoting sustainability of any programmes that would be impacted by yield and energy balance.

Agenda item 8

Formulating public policies for Biofuels: ECLAC's methodological approach

This presentation was placed within the context of ECLAC's mission to provide support to the countries of the region in the design and implementation of "integrated" public policies, for the sustainable development of endogenous energy resources and this included biofuels. It addressed the driving forces of biofuels in terms of demand, availability of resources and possible impacts in development of the sector in Latin America and the Caribbean.

The role of the State in development of the biofuels was examined in terms of the factors that influenced the promotion of biofuels at the national level and the real challenge of maintaining a sustainable demand was highlighted. The tasks to be addressed by governments were also provided.

Fiscal incentives for development of the biofuels sector in the Caribbean were mentioned using examples from Argentina, Colombia, Brazil and Bolivia. In general, these comprised tax incentives for investment as well as exemption from tariffs on feedstock. The importance of a regulatory market was emphasized and examples of the modality of implementation in key countries were presented. The necessity of assessing both the financial and the socio-economic profitability associated with the production and use of biofuels was stressed and the need for feasibility studies was emphasized.

ECLAC's approach to the formulation of policies for biofuels was then featured and this included an examination of the economic, social and environmental dimensions of sustainable development. The importance of developing a sustainable architecture for introduction of biofuels was stressed and this would involve interplay between the energy, agricultural, economic and social aspects.

Identifying streamlined country “situations” through articulation of public policies for each aspect was important. This would entail identification and quantification of key parameters that would influence development of the biofuels sector and determining the feasibility of so doing. A specific methodology was developed based on identified parameters and a schematic “spider web” could be constructed using the data to depict the feasibility. The methodology was applied to the Guyana situation (Day 3).

Discussions on this session focused on development of the biodiesel sector in the Caribbean and the feedstock that could provide maximum returns. One of the challenges that was articulated by participants was the disparity in advice offered by technocrats. This left authorities in a quandary as to what were the best options. It was suggested that such advice should be based on feasibility studies that needed to be vetted by relevant independent experts prior to making final decisions.

Agenda item 9

Introduction to the exercise methodology and putting theory into practice – application of the ECLAC methodology at the national level

In his introduction to the topic, Mr. Cesar Chavez, ECLAC Consultant, noted that while the meeting was specific to biofuels, the methodology was flexible enough to be applied in any sector where policy solutions were needed. The methodology would be demonstrated by example and not theory identifying a country for which a biofuel policy needed to be developed.

The methodology

The methodology was described as a complex one with several steps. The first step was the identification of all the stakeholders or actors since these were the persons to decide whether or not a policy would be implemented. The next major step was to identify the problem following which a matrix for strategic line identification was to be developed. Once the problem was identified, the next step was to determine the desired objective and then identify the steps that would transform the problem, defined as the negative, to the solution, defined as the positive or the positive outcome desired. This was not as simple as it sounded but required the development of a matrix, which was quite a complex process. The methodology involved the setting up of a separate matrix for each identified objective. The two factors to be considered were the internal factors and the external factors.

Internal factors and external factors: The weaknesses and strengths were the internal factors or aspects of the matrix, while the external factors were the threats and opportunities. The analogy of a football coach preparing his team for a game was used, where the internal factors were those specific to your team, i.e. the team’s strengths and its weaknesses. The external factors were specific to the opposing team, which would translate to the threats and opportunities for your team. Similarly, for attaining the objective that had been identified, the policy makers would determine (in this case), the country’s strengths and weaknesses as it pertained to the specific goal, as well as the threats and opportunities that presented themselves. It was stressed that

within this context, it was very important to be aware of the situation and to have clear and specific goals from which then lay the possibility to develop a strategic plan of action.

Instrument identification matrix: It was important that the actual situation be assessed, i.e, what existed at present and determining the objective or the desired outcome. Once these two critical areas had been noted the first step was to identify a strategic line which, it should be noted, would be conceptual proposals. The next step would be to identify the instruments or actions to be applied to arrive at the identified objectives.

Viability and players: Before taking action, it was necessary to ascertain the viability of the proposal and the players or actors who would be involved since the viability would depend on the willingness of the various players or stakeholders. There were four main viabilities to be taken into consideration as follows: technical viability; political viability; economic viability and social viability. The viability would depend on all the stakeholders who directly affected or could have an impact on the situation. These could include persons from the public sector, private sector, and civil society. The stakeholders might be divided into two groups, those who were likely to support the decision and those who were likely to be in opposition, the latter of whom might be needed to be won over. It was expected that there would be varying degrees of support and/or opposition which must also be taken into consideration. It should be noted that the role of the player might change depending on the different objectives.

Agenda item 10

Putting theory into practice – application of the ECLAC methodology at the national level

With specific regard to the adoption of a policy on the use of biofuels, the situation that currently existed in Suriname was used to apply the methodology. Step one was identification of a specific problem and the desired outcome with priorities that would be applicable to that country. Because there would be more than one challenge to overcome, it was agreed that one problem would be selected and the reasons for the problem. In the methodology, this was one of the very first issues to be addressed, that of the reason for the problem or the origin of the problem.

Problem

One of the reasons for the absence of a policy to promote the use of biofuels in Suriname was a lack of technical expertise. In applying the methodology, the reasons for this were identified, such as limited knowledge of the subject, small human population, no brain drain, lack of political will, among other things. Mr. Chavez stated that all the reasons must be analysed in detail, if the desired objectives were to be achieved.

For the exercise, one of the reasons, limited knowledge of the subject, was used to demonstrate the methodology. Three aspects of the problem had to be properly taken into consideration as one of the first steps, as follows:

- (i) Reason
- (ii) Problem
- (iii) Manifestation

The second step was to identify the players or stakeholders, i.e., those persons who would directly have some impact on the specific problem which, in this case was lack of technical expertise. During the process, the objective must always be at the fore with the knowledge that the objective was not an action. It was also important that the situation reflected the reality.

Using the methodology and the specific problem identified, the next step was to identify the strengths, weaknesses (internal factors peculiar to this problem to be overcome) and the threats and opportunities (the external factors). For the exercise, two of each of the above were identified - two weaknesses, two strengths, two threats, two opportunities.

The matrix for this specific problem was drawn up to illustrate.

External	Internal					
	Weaknesses			Strengths		
Threats	(i)	(ii)	(iii)	(i)	(ii)	
(i)						
(ii)						
(iii)						
Opportunities						
(i)						
(ii)						
(iii)						

The above matrix must be done for all strategic lines or all the problems that were identified to be overcome in achieving the specific objectives. Once this matrix has been completed, this has to be placed on another matrix that takes the players or stakeholders into consideration. This “player” matrix is more complicated since it involves to a large extent, an interpretation of each of the player’s roles. In the case study, the players who would directly have some impact on the implementation and outcome were as follows: ministry of energy, ministry of foreign affairs, ministry of agriculture, ministry of science and technology, ministry of the economy, private sector investors, non-governmental organizations, staff of the research institutes, national energy commission. The matrix of players is set up to determine which players will support the selected instruments and which will oppose, as well as the degree of support and opposition.

The exercise in creating a biofuels policy for Jamaica was completed and it was concluded that indeed, the country was in a good position for developing its biofuels potential.

Another exercise in determination of the feasibility of developing the biofuels potential for Guyana was embarked upon. This exercise utilized a tool that sought to rate the different factors that would impact on the development of biofuels in the country and to reach a conclusion as to its viability. For the example shown by Guyana it was determined that it was indeed feasible to develop the biofuels sector.

Agenda item 11 **Completion of the exercise on biofuels policy-making by Jamaica**

The final proceedings involved an assessment of the benefits of the workshop by the participants. The representatives of Jamaica reflected that the workshop provided a forum for intra and interregional dialogue and was especially helpful in learning what was occurring in the region. The policy-making tool was excellent and provided a practical method of policy-making which could be employed at the Centre for Renewable Energy (CERE) as they were currently conducting a SWOT analysis. They thought that good ideas for cooperation, especially with Guyana, had been obtained and they could return to Jamaica with information on application of the methodology.

The representative from the United States considered the workshop a good opportunity to listen and learn and it provided a good understanding of the challenges being faced by countries in developing the biofuels sector. He would be sharing the information acquired with his office in Washington with a view to better informing internal policy to maximize impacts. He welcomed the opportunity to interact with colleagues from the Caribbean region especially as the United States was already doing so in four countries in the Latin America and the Caribbean region.

The representatives from Guyana expressed the view that the objective of reviewing the current status of biofuels in the region had been achieved. They appreciated the forum for sharing information and experiences and considered the tools as being very useful for use in updating their Biofuels Strategy Paper. Guyana looked forward to continued cooperation with other countries in the region and with Brazil in continuing dialogue. The presence of the Caribbean Renewable Energy Development Project may have enhanced the discussions as they had prepared a draft Regional Energy Policy, the contents of which could be informed by the methodology.

The representative from the Dominican Republic stated that the workshop helped to change his view on biodiesel and that he had obtained sound information that would help in problem-solving. He issued an invitation to a seminar on energy to be held in his country in January 2008.

Barbados expressed regret at being unable to complete the survey that would have been used in applying the tool to determine the feasibility of developing biofuels in the country. However, the model would be shared with the relevant authorities in the country. Although Barbados already had a draft energy policy, the information obtained at this meeting would certainly be incorporated into the existing draft and used to finalise it. Their particular interest was in photovoltaics and the tool and methodology would be used to develop that policy. They

would be having discussions with Jamaica in the establishment of a Centre for Renewable Energy in order to provide complementarity and avoid duplication in mandates so as to maximize the use of resources in the region.

Trinidad and Tobago did not have much interest in biofuels and activity in this area was limited to importation of raw bio-ethanol from Brazil for purification and export to the United States. However, one of the prisons was currently converting human waste into biogas for domestic use. The country was still interested in developing the renewable energy sector focusing on wind, solar, wave and hydrogen. They may import bio-ethanol from Guyana in the near future.

St. Kitts and Nevis articulated that the workshop was evidence of the importance of biofuels in the region. The results could be vital in informing policy in the country and could address the issue of import substitution. The workshop provided a forum for countries to work together and was a good model for sharing experiences. The representative also made mention of funding available under the European Union/African Caribbean Pacific (EU/ACP) initiative for support in the renewable energy sector and suggested that this might be accessed. Accessing funding from the OAS was also suggested.

Suriname was pleased with the opportunity for meeting other colleagues and for forming relationships. The country was now introducing biofuels and was previously looking to Europe for guidance. However, they could now build a network with Guyana and Jamaica and other Latin American countries. They also planned on liaising with Barbados to establish a Centre for Renewable Energy.

The Adviser to the President of Guyana on Sustainable Development considered the workshop a good forum for extending the bio-energy link in the Caribbean. Exposure to the ZOPP methodology, although not new, was good. The suggestion was made that the methodology could be made more user-friendly by being presented in digital format and perhaps in two versions, one for use in thorough lengthy exercises and another for quick analysis. He indicated the importance of placing activities such as this within the context of the Mauritius Strategy (MSI) and the Regional Coordinating Mechanism (RCM). He addressed the request for sharing of experiences and invited Jamaica and Suriname to liaise with Guyana in development of their biofuels sectors. He regarded the workshop initiative as opening the door for meaningful cooperation in bio-energy and for having it share a role in a larger Caribbean agenda.

In reaction to the comments from participants, the representative of ECLAC Headquarters recognized that the target of the discussion on biofuels at the regional level had been achieved by encouraging dialogue. He proposed the initiation of a national real-life application of the tool for policy-making and public policy design in 2008. He also suggested the establishment of regional dialogue through a Caribbean Biofuels Cooperation Initiative (CBCI) that would serve to encourage networking among countries. St. Kitts and Nevis thought this to be an excellent idea and suggested that it could be based in Jamaica. Jamaica would take this idea to the government for approval.

The Director of the ECLAC Subregional Headquarters for the Caribbean summarized the proceedings as follows:

1. Facilitation was excellent.
2. The ZOPP methodology was applicable not only for biofuels but for other areas.
3. The workshop provided a forum for sharing information and experiences.
4. The need to take this experience to another stage of networking and cooperation was necessary.
5. Establishment of the CBCI would be pursued by ECLAC and would be discussed in meetings with relevant officials in Jamaica and Barbados before the end of the year.
6. There was need to examine funding for continuance of the work on biofuels from the EU. To facilitate this, the region needed to plan both nationally and regionally prior to approaching donors, to streamline applications at the policy level and to promote cooperation within the region.
7. The results of this workshop could be taken to a higher level through dialogue with CARICOM and, in this regard, discussion would be taking place with relevant officials at an upcoming planning meeting for the next COP on climate change.
8. There was need to anchor this initiative with the RCM and the MSI and ECLAC was fully supportive of this.

Annex 1**AGENDA**

1. Welcome remarks
2. Adoption of the agenda and organization of work
3. Introduction to the workshop methodology
4. National biofuels scenarios and challenges faced in the development of this sector
5. Identifying main and common obstacles in formulating biofuels policies in Caribbean countries
6. Biofuels policy in Latin America and the Caribbean: the ECLAC perspective
7. Biofuels policy in Latin America and the Caribbean: the Brazilian perspective
8. Formulating public policies on biofuels: the ECLAC methodological proposal
9. Introduction to the exercise methodology
10. Putting theory into practice – application of the ECLAC methodology at the national level
11. The role of ECLAC in strengthening intergovernmental cooperation for sustainable production and use of biofuels at the national and subregional levels.
12. Discussion on : “*Strengthening inter-government cooperation for a sustainable production and use of biofuels*”, both at national and subregional level
13. Closure of the meeting

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