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Regional Office for Latin America and the Caribbean**

PROGRAMA DE LAS NACIONES UNIDAS PARA EL AMBIENTE  
PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT

**Sixteenth Meeting of the Forum of  
Ministers of Latin America and the Caribbean**

**Santo Domingo, Dominican Republic  
27<sup>th</sup> January to 1<sup>st</sup> February 2008**

A. PREPARATORY MEETING OF EXPERTS  
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**Meeting of the Technical Advisory Committee  
on Geo-Spatial Information and Earth  
Observation Systems of the Working Group  
on Environmental Indicators (WGEI)**

**Panama City, Panama  
6 July 2007**

**Addendum 1 to Reference Document on  
*Environmental Indicators*  
- UNEP/LAC- IGWG.XVI/Ref.2 -**



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## Summary

### Words of welcome:

- **Mrs Ligia Castro**, Administrator, National Environment Authority (ANAM), Panama.
- **Mrs Kakuko Nagatani**, UNEP Regional Office for Latin America and the Caribbean.
- **Mr Emilio Sempris**, Representative of Panama, coordinating country for the Technical Advisory Committee on Geospatial Information and Earth Observation Systems (TAC) of the WGEI.

Presentation of the participants.

**RAP 2006-2007 implementation and pending tasks, the Working Group mechanism and possible RAP 2008-2009 tasks** (Mr Edgar E. Gutiérrez, Representative of Costa Rica, coordinating country of the WGEI of the Forum of Ministers of the Environment of Latin America and the Caribbean). In his presentation he underlined:

- Since the Tenth Meeting of the Forum was held in Argentina in 1998, the environment ministers in LAC have been considering the theme of indicators.
- In 2002, at the Johannesburg summit, ILAC was presented and the goal of establishing indicators was adopted.
- Decision11 of the meeting of the Forum of Ministers of the Environment in 2005 determined what indicators should be used to enforce the goals. The same decision requested that the Technical Advisory Committee of the WGEI should form a working group to identify training needs and that include geospatial information should be included.
- Finally, responses are invited concerning specific tasks and that the ILAC goals should be reviewed to see on where Group may be of help. Compliance with some of ILAC goals could lead to the Atlas being completed.

In the discussion that followed attention was called to:

- The composition of the WGEI and the different nature of the TAC whose participants, besides voicing their concerns about the state of the environment, should be willing to share data and devote time to its activities.
- There are eight priorities in the ILAC goals (1.Genetic resources; 2.Management of water resources and integral watershed management; 3.Vulnerability of human settlements; 4.Renewable energy; 5.Trade and the environment; 6.Economic instruments and fiscal policy; 7.Climate change; 8.Environmental indicators). While these are priorities, the Group may also assist with others.
- It is suggested that indicators be reviewed to see which ones can be measured by using geospatial information.

**TAC mandate and work plan** (Mr Emilio Sempris).

A preliminary draft work plan was presented to the TAC and recommendations received. The objective is to establish a small initial number of specific projects that will yield relevant products.

The plan seeks to ensure that all the centres work in the same way and in the same direction

The plan's activities:

- To make an inventory/assessment of what the region already has in terms of human resources and equipment/infrastructure. See what each country can contribute to this initiative.
- Link to users' needs.
- Strengthen capacities. Promote technical-level meetings and training courses.
- Achieve interoperability with final users so that they may find the information they need.
- Organize events/discussion forums and exchanges of experiences.
- Prepare a work plan to present to the Forum of Ministers.
- Establish relations with hardware and software providers.
- Strengthen the access and exchange of information platform.
- Standardize and harmonize data and information.
- Produce items such as the environmental atlas and the inventory of data and users.
- Define how to diagnose capacities of the TAC and of the WGEI.
- Discuss the geographic reference system to be used.
- An effort is being made on the theme of human settlements.
- Revise the methodological sheets.
- Mention was made of the agreement between INEGI and CONABIO on developing geospatial information.
- Facilitate dissemination of geospatial information. Given the limited bandwidth, this is difficult to do over the Internet.
- A network of LAC universities is working with high-speed Internet 2.
- Define how the information is to be presented to decision-makers.

**Presentations of relevant initiatives**

- Presentation on GEOSS and the Group on Earth Observation, Mrs Silvia Giada, UNEP, gave a summary of the history of the GEO (Group on Earth Observation) and of GEOSS (Global Earth Observation System of Systems), UNEP's participation and its importance for the Committee.
- Presentation on [SERVIR](#), Mr Emilio Sempris gave an online presentation on the system.

Presentations of relevant initiatives

**Presentation on DETER**, Carlos Felgueiras commented on INPE activities:

- Free distribution of Landsat images of Brazil and South America
- Technology (software) development and methodologies such as SPRING which is in the public domain to analyze data that could be integrated with SERVIR and where there is an open source library to develop personalized software.

[DETER](#) (Deforestation Detection in Real Time) is also available for use by other countries

- Different types of training courses.

**Presentation of information sharing tools developed in Mexico**, Mr Francisco Javier Jiménez Nava; INEGI, Mexico, explained the [IRIS](#) system which is an informatics application designed to cover the principal capacities of Geographic Information Systems now available and focussed on the needs of producers of geographic information, the National Register of Images ([RNI](#)) and Mexico's geographic information portal, ANIM, among others.

#### **Other initiatives**

**CONABIO:** Mrs Maria Isabel Cruz López described the activities of CONABIO calling particular attention to the Chetumal Antenna Project on acquiring and operating a reception antenna to cover all of Central America and almost all of Mexico.

**CONAE:** Mr Gabriel Platzeck presented the history and activities of the National Space Activities Commission (CONAE), including the activities of the Cordoba station, a description of the Argentinean SAC-B, SAC-A y SAC-C satellites and activities on the theme of disasters.

**OCHA:** Mr Rogério Mobilia Silva presented [REDHUM](#) on line.

**CIAT,** Mr Glenn Graham Hyman spoke about the work done by CIAT in installing a network to provide high speed Internet to download satellite images, and on making a portal available to provide geographic information using the GEO network developed by FAO.

**University of West Indies:** Mrs Sahiba Ali explained that in the English-speaking Caribbean many assessments of needs had already been made; she also emphasized that, because they are small islands they need high resolution images; however, there is often no cover for these types of data. One of the problems in the Caribbean is the lack of willingness to share data and, therefore, it is essential to have the support of Ministers. This Group can serve as a channel to transmit to Ministers the message about the need for geospatial data.

#### **Revision of the draft work plan for 2006-2007 and discussion on implementing it**

Mr Emilio Sempris gave a three-part summary of the ideas about activities that had emerged from earlier discussions and were now up for discussion by the Committee:

##### 1. Inventory of users and their capacities

In the discussion that followed it was decided that:

- UNEP will update its focal points list with information provided by governments.
- CATHALAC and INEGI will prepare a draft questionnaire to be revised with the Committee and sent to focal points to be identified by UNEP.

##### 2. Capacity Building:

In the discussion that followed it was decided that:

- This activity may be supported by other TAC activities and the questionnaire used to see where training is needed; the Atlas may be used as an example of a concrete training experience.
- The Spanish translation of the catalogue was produced by INPE.

- Revise programmes and training courses on geospatial information in the different countries. CentroGeo and INPE will prepare an inventory of initiatives and training programmes already existing in the region.

3. Specific products

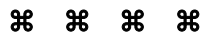
In the discussion that followed it was decided that:

- The members of the TAC will help to produce the Atlas for LAC by providing specific examples. It is not realistic to expect the Atlas to be ready for the next meeting of the Forum of Ministers in November, but some examples and the methodological framework must be presented to the Forum.
- The themes of the ILAC goals were assigned to the institutions represented with the promise that, within the next two weeks (until 20 July) the indicators will be analyzed to provide: a) the lead institution with methodological details for analysis or other indicators for the goal. During the following week (up to 27 July) the lead institution will deliver the results to CATHALAC. The areas were assigned as follows:
  1. Biological diversity: CONABIO leads with support from CentroGeo and probably from INPE (prior consultation with the section of INPE concerned with these themes)
  2. Water resources management: CATHALAC leads with support from CIAT (on themes relating to droughts) and CONAE.
  3. Vulnerability, human settlements and sustainable cities: CATHALAC leads with support from CIAT, REDHUM (to consult) and CONAE (specifically on Goal 3.6)
  4. Social issues, including health, inequity and poverty: INEGI leads with support from CentroGeo (specifically on Goal 4.1/3 and Goal 4.3/1).
  5. Economic issues, including competitiveness, trade and production and consumption patterns: will be analyzed by CONAE.

Each index card must keep to the format of the methodological sheets and include materials needed and costs, geographic and temporal cover of the indicator with the proposed method.

The University of the West Indies will consult other institutions in the Caribbean to see in which areas support can be provided.

Closing remarks by Emilio Sempris, Kakuko Nagatani and Edgar E. Gutierrez.



## Annex 1 Agenda

<b>8.00 – 8.30</b>	Registration
<b>8.30 - 9.15</b>	<p>▶ Words of welcome:</p> <ul style="list-style-type: none"> <li>• Mrs Ligia Castro, Administrator, National Environment Authority (ANAM), Panama</li> <li>• Mrs Kakuko Nagatani, UNEP Regional Office for Latin America and the Caribbean</li> <li>• Mr Emilio Sempris, Representative of Panama, coordinating country of the Technical Advisory Committee on Geospatial Information and Earth Observation Systems (TAC) of the WGEI</li> </ul>
<b>9.15 - 9.35</b>	Presentation of the participants
<b>9.35-10.00</b>	<p>▶ Implementing RAP 2006-2007 and its pending tasks, the Working Group's mechanism and possible tasks for RAP 2008-2009, Mr Edgar E. Gutiérrez, Representative de Costa Rica, coordinating country of the WGEI of the Forum of Ministers of the Environment of Latin America and the Caribbean</p> <p><b>Objectives:</b> Inform the TAC about the results of the WGEI meeting. <b>Materials:</b> RAP 2006-2007.</p>
<b>10.00-10.40</b>	<p>▶ TAC mandate and work plan, Mr Emilio Sempris.</p> <p>▶ Presentations of relevant initiatives</p> <ul style="list-style-type: none"> <li>• Presentation on GEOSS and its Group on Earth Observation, Mrs Silvia Giada, UNEP</li> <li>• Presentation on SERVIR, Mr Emilio Sempris</li> </ul> <p><b>Objectives:</b> Learn about existing initiatives to be used as a basis for the work of the TAC and discuss its mandate and role in the context of the WGEI. <b>Materials:</b> Draft TAC work plan.</p>
<b>10.40-11.00</b>	Break
<b>11.00-12.30</b>	<p>(continuation)</p> <p>▶ Presentations of relevant initiatives</p> <ul style="list-style-type: none"> <li>• Presentation on DETER, (to confirm)</li> <li>• Presentation of information-sharing tools developed in Mexico, Mr Francisco Javier Jiménez Nava; INEGI, Mexico</li> <li>• Other initiatives</li> </ul> <p>▶ Discussion on the TAC mandate and ToR</p>
<b>12.30-13.30</b>	Lunch
<b>13.30-15.30</b>	<p>▶ Revise the 2006-2007 draft work plan and begin preparing the 2008-2009 plan, Mr Emilio Sempris.</p> <p><b>Objectives:</b> Revise the 2006-2007 TAC work plans and begin preparing the 2008-2009 work plans. <b>Materials:</b> TAC draft work plan.</p>
<b>15.30-15.50</b>	Break
<b>15.50-17.00</b>	<p>▶ Discussion on implementing the 2006-2007 and 2008-2009 work plans, Mr Emilio Sempris.</p> <p><b>Objectives:</b> Reach a consensus on the 2006-2007 TAC work plan and begin preparing the work plan for 2008-2009. <b>Materials:</b> TAC draft work plan.</p>
<b>17:00 – 17:15</b>	<p>▶ Closing remarks:</p> <p>Mr Ricardo Sánchez, Director Regional UNEP/ROLAC</p>

## Annex II List of Participants

Name	Institute	E-mail
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## Annex III

### Table of decisions on the Methodological Sheets for the Indicators

Matrix of the ILAC Working Group commitments				
Thematic Area	Goal	Indicator	Comments	Decision
<b>1. Biological Diversity</b> <sup>(1)</sup>	<b>Goal ILAC 1.1 Increase the forest area</b> Ensure sustainable management of forest resources in the region, significantly reducing annual deforestation rates.	Land covered by forests		Colombia and Argentina will make the changes and lead the work process with support from the TAC (CIAT Colombia)
	<b>Goal ILAC 1.2 Territory included in protected areas</b> Increase significantly the territory in the region under protected area regimes and, when defining them, include buffer zones and biological corridors.	Protected areas		Colombia and Argentina will make the changes and lead the work process with support from the TAC (CIAT Colombia)
	<b>Goal ILAC 1.3 Genetic resources – Equal sharing of benefits</b> Adopt regulatory frameworks for access to genetic resources, as well as for fair and equitable sharing of the benefits derived from their use, compatible with the Convention on Biological Diversity	National laws on access to genetic resources and sharing of benefits		Mexico will coordinate with SEMARNAT and revise the proposal
	<b>Goal ILAC 1.4 Marine diversity</b> Ensure the conservation and proper use of marine resources in the countries of the Wider Caribbean with particular emphasis on marine and coastal ecosystems.	Protected coastal and marine areas	It is suggested it be standardized with the MDGs and the ILAC definition of national waters also be taken, using all the categories of UICN 1-6.	Costa Rica, taking these suggestions into account, will make the final revision.

<sup>(1)</sup> At the TAC meeting on 6 July, work in this area was assigned to CONABIO and Mexico's CentroGeo with possible INPE support.

Matrix of the ILAC Working Group commitments				
Thematic Area	Goal	Indicator	Comments	Decision
<b>2. Water Resources Management</b> <sup>(2)</sup>	<b>Goal ILAC 2.1 Freshwater supply</b>			
	1. Improve technology for more efficiency in water use in industry and agriculture and for domestic consumption.	Index of surface water shortage	There is a contradiction, which did not exist originally, between the name of the indicator and the measurement. It is suggested the name be changed to clarify this. Data on water production are not always available but, with the support of Mexico and Peru, it was decided to accept this suggestion	Costa Rica will continue to lead, supported by Mexico and Peru.  The methodological sheet had been proposed by Colombia and will be passed to Mexico for coordination
		Water consumption per inhabitant	There are problems in considering the GDP when calculating the indicator because it may not reflect the goal	Costa Rica revises inconsistencies between the name of the indicator and the its unit of measurement
	2. Introduce modern desalination technologies.	Desalinated water		UNEP will follow up
	3. Integrate the management of coastal aquifers to avoid saline intrusion.	Regulatory frameworks, aquifer management quotas		UNEP will follow up
	<b>Goal ILAC 2.2 Watershed management</b> Improve and strengthen institutional arrangements for the integrated management of watersheds and aquifers by, among other measures, establishing water basin committees with the participation of all sub-national levels of government, civil society, the private sector and all stakeholders.	Water basin committees	Previously, the name of the indicator had been changed but the measurement is the percentage. This does not apply to Brazil or Argentina. Colombia proposes a number of basins with land use or management plans (number of basins or hectares). Some small basins have management plans but they only apply to part of the basin. It was said that the indicator does not represent the goal	The sheet will continue to be revised ECLAC has offered to make the names of the indicators consistent and take the measurement from the name for all the indicators.
	<b>Goal ILAC 2.3 Management of</b>			

<sup>(2)</sup> At the TAC meeting on 6 July, work in this area was assigned to CATHALAC with support from CIAT and CONAE.

Matrix of the ILAC Working Group commitments				
Thematic Area	Goal	Indicator	Comments	Decision
	<b>marine and coastal areas and their resources</b>			
	1. Implement national and regional action plans for the integrated management of coastal resources and coastal ecosystems, with particular attention to the Small Island Developing States.	Marine fish catch		PANAMA will send the methodological sheet back to the Group to continue the discussion. Panama Mexico, Peru and Argentina lead
	2. Adopt a holistic and integrated approach to the management of the Caribbean Sea through the development of a comprehensive strategy for its protection and use.	Projects or financial resources to improve Caribbean Sea or coastal management		St. Lucia will coordinate and propose the first sheet
	<b>Goal ILAC 2.4 Better quality of inland waters</b> Improve the quality of effluents and reduce the discharge of pollutants into surface water bodies, groundwater and coastal areas.	Population with access to sanitation	Review information on this indicator with PAHO Add an indicator as “% of treated waste collected”	Costa Rica leads
<b>3. Vulnerability, human settlements and sustainable cities<sup>(3)</sup></b>	<b>Goal ILAC 3.1 Land use planning</b>			
	1. Implement land-use planning policies and plans from a sustainable development approach	Sub-national land use plans	Promote discussion in the virtual forum. It is agreed to include in the discussion forum the political administrative division of each country.	Revise each country's information and include it in the Forum
	2. Incorporate risk management instruments in land-use planning	Land use	Argentina utilized the change in agricultural/use. Ambiguous interpretation. No data or no reliable data. TAC support is proposed for data on this indicator. The name of the indicator has little to do with the proposed variable. In CR environmental variability indexes were developed and these could be used to measure management. The goal refers to risk management instruments that are hard to define. CR agrees with the proposal. It is also suggested that some	This indicator does not reflect the goal and needs revision.

<sup>(3)</sup> During the TAC meeting on 6 July, work in this area was assigned to CATHALAC with support from CIAT and possibly from OCHA.

Matrix of the ILAC Working Group commitments				
Thematic Area	Goal	Indicator	Comments	Decision
			goals be included with other information.	
	<p><b>Goal ILAC 3.2 Areas affected by degradation processes</b></p> <p>Reduce significantly the areas of the region subject to erosion, salinization and other soil degradation processes.</p>	Degraded areas	Sheet finalized	
	<p><b>Goal ILAC 3.3 Air pollution</b></p> <p>Reduce the concentration of polluting emissions in the air.</p>	Motor vehicle fleet	The indicator's time period was changed to biannual in even years. Earlier it had been decided to keep it as an annex to the methodological sheets	Costa Rica leads the follow-up, Brazil will make a methodological sheet proposal
		Carbon dioxide emissions	Sheet finalized	
	<p><b>Goal ILAC 3.4 Water pollution</b></p> <p>Increased coverage of drinking water services and wastewater treatment.</p>	Population with access to drinking water	Sheet finalized	
		Population with access to sanitation	There was not enough time to consult with PAHO. Argentina uses a Proxy. Brazil replied to Goal 2.4; is replying to 3.4 and will send its comments	As it is one of the MDGs, use an already developed methodological sheet
	<p><b>Goal ILAC 3.5 Solid waste</b></p> <p>1. Reduce significantly solid waste generation (domestic and industrial) and, among other measures, promote recycling and reuse</p>	Solid waste collection		Costa Rica leads the follow-up of the discussion with support from Mexico, Panama (has promised to provide data on the city) and Colombia
		Solid waste production in the principal capital cities		Costa Rica leads the follow-up of the discussion with support from Mexico, Panama (has promised to provide data on the city) and Colombia
	<p>2. Implement integrated management of solid waste, (domestic and industrial), including</p>	Solid waste collected and properly disposed		Costa Rica leads the follow-up of the discussion with support from Mexico, Panama (which

Matrix of the ILAC Working Group commitments				
Thematic Area	Goal	Indicator	Comments	Decision
	appropriate treatment and final disposal..	of.		has promised to provide data on the city) and Colombia
	<p><b>Goal ILAC 3.6<sup>(4)</sup> Vulnerability to anthropogenic disasters and those caused by natural phenomena</b></p> <p>Implement and strengthen regional risk management cooperation mechanisms to lessen the impact of anthropogenic disasters and those caused by natural phenomena, including setting up a regional early-warning system and forming rapid response groups</p>	National emergency commissions or rapid response groups	Sheet finalized	Costa Rica leads the follow-up
	<p><b>Goal ILAC 3.7 Vulnerability and risk management</b></p>			
	1. Refine and apply vulnerability indicators.	Population living in areas of high risk		Cuba was responsible and now UNEP will follow up
		Victims of natural disasters	Peru is continuing work on this. ECLAC has a lot of data (in the yearbook) on this and offers this data base to Peru. Colombia has offered support	Peru continues to lead with support from Colombia
	2. Incorporate indicators into national development plans.	National development plans that include or consider the theme of vulnerability to risks and also include indicators to monitor such risks	The name had already been changed	Costa Rica leads the follow-up

<sup>(4)</sup> At the TAC meeting on 6 July, CONAE offered to support the work of this Goal on indicators.

Matrix of the ILAC Working Group commitments				
Thematic Area	Goal	Indicator	Comments	Decision
<b>4. Social themes, including health, inequality and poverty<sup>(5)</sup></b>	<b>Goal ILAC 4.1 Health and environment</b>			
	1. Implement policies and plans to reduce environmental risks that cause damage to health, in particular those transmitted by water, vectors, air pollution and exposure to chemical substances.	Morbidity from acute respiratory diseases	Prepare the corresponding methodological sheet	Costa Rica leads the follow-up with support from Argentina and Brazil
		Morbidity from water-borne diseases	There is a discrepancy between the concept of attributable; associate should be used in the name of the indicator.	Costa Rica coordinates the revision of the sheet, Argentina and Brazil has offered to help to conceptualize the indicator
	2. Implement comprehensive measures to control and reverse the spread of the HIV/AIDS epidemic including development of coordinated approaches to research, education and treatment, and access to retroviral drugs.	Morbidity from HIV/AIDS	Sheet finalized	
	3. Increase the proportion of green and healthy areas per capita.	Urban green areas	Review the indicator with HABITAT to unify the urban and rural concepts (Maru). Discussions should continue on improving the methodological sheet. It is suggested that TAC help to look for information	Costa Rica leads the follow-up
<b>Goal ILAC 4.2 Environment and job creation</b>	Sustainable development projects and programmes and the total number of personnel working on the project	Goal 4.2 indicator of (Job creation in sustainable development programmes or activities). The definition of preservation must be improved. It is suggested a test be made in Argentina. Collect the information from all institutions that promote programmes of this type, otherwise, the information will be incomplete.	Argentina suggests further development of the proposal and that proxy indicators be sought. These discussions should be held in the Forum.	

<sup>(5)</sup> At the TAC meeting on 6 July, work in this area was assigned to INEGI with support from CentroGeo on Goals 4.1.3 y 4.3.1

Matrix of the ILAC Working Group commitments				
Thematic Area	Goal	Indicator	Comments	Decision
			<p>A decision must be made about which projects and programmes we are including.</p> <p>Include the rural approach.</p> <p>Find out what statistics are available.</p> <p>A revision of Agro Plan 2005 is recommended.</p>	
	Promote the formulation and implementation of sustainable development projects and programmes that will help to create jobs and avoid migration and displacement.	Creating jobs in sustainable development programmes and activities	<p>Indicator of Goal 4.2 (Job creation in sustainable development programmes or activities). The definition of preservation must be improved.</p> <p>It is suggested a test be made in Argentina.</p> <p>Collect the information from all institutions that promote programmes of this type, otherwise, the information will be incomplete.</p> <p>A decision must be made about which projects and programmes we are including.</p> <p>Include the rural approach.</p> <p>Find out what statistics are available.</p> <p>A revision of Agro Plan 2005 is recommended.</p>	Argentina suggests further developing the proposal and that proxy indicators be sought. These discussions should be held in the Forum
	<b>Goal ILAC 4.3 Poverty and inequity</b>			
	1. Drastically reduce poverty rates in the region's countries.	Population with income of less than US\$1 per day	Sheet finalized	
		Households with property title rights (secure land tenure)	Adapt the methodological sheet to the proposal by Peru and prepare the new methodological sheet	<p>Mexico, Brazil and Colombia lead</p> <p>Proposal to use MDG 7 INCIDENCE OF POVERTY OR INDIGENCE (The World Bank has this indicator) Argentina will help with this work.</p>

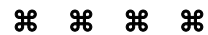
Matrix of the ILAC Working Group commitments				
Thematic Area	Goal	Indicator	Comments	Decision
	2. Create sustainable livelihoods by developing micro-enterprises.	Growth of small enterprises		Costa Rica continues to revise the information and suggests it be harmonized
	3. Formulate and implement strategies for women, youth, indigenous peoples, people of African descent, migrants, disabled and other minority groups of the region in accordance with human rights and fundamental freedoms.	Social cost	Adapt the methodological sheet to the proposal made at the meeting and prepare the new methodological sheet. Each country would have to add an addendum to improve the methodological sheet. It was shown that the indicator does not respond to the Goal	Mexico leads
<b>5. Economic aspects, including commerce and production and consumption patterns<sup>(6)</sup></b>	<b>Goal ILAC 5.1 Energy</b> Increase renewable energy use in the region to at least 10% of its total energy consumption by the year 2010	Use of energy	Sheet finalized	
		Population using solid fuels		
		Energy supplied from renewable sources	It is suggested it be adapted to the MDG 7 complementary indicator, changing consumption to supply. It was commented that this indicator should be in Goal 4.1 with which it is more closely associated.	Costa Rica continues with the work considering MDG and ECLAC methodological sheets with suggestions by Mexico and ECLAC
	<b>Goal ILAC 5.2 Cleaner production</b>			
	1. Install clean production centres in all the countries of the region.	Chlorofluorocarbons that deplete the ozone zone	Sheet finalized	
	2. Incorporate the concept of cleaner production in a significant number of the main industries, with emphasis on small and medium-sized enterprises.	Companies with ISO 14001 certification		Colombia will take the lead in defining the new methodological sheet

<sup>(6)</sup> At the TAC meeting on 6 July, work in this area was assigned to CONAE.

Matrix of the ILAC Working Group commitments				
Thematic Area	Goal	Indicator	Comments	Decision
	<p><b>Goal ILAC 5.3 Economic instruments</b></p> <p>Establish a system of economic incentives for productive and industrial processing projects that will save natural resources and energy and eventually reduce the amount of effluents discharges into water, land and the air.</p>	Economic instruments applied in the country	Prepare the corresponding methodological sheet	Decision: Mexico leads
<b>6. Institutional Aspects<sup>(7)</sup></b>	<p><b>Goal ILAC 6.1 Environmental education</b></p> <p>Improve and strengthen the incorporation of the environmental dimension into formal and non-formal education, the economy and society.</p>	No indicator has yet been defined	There is no indicator. A new proposal to be considered.	SEMARNAT will propose a methodological sheet with support from Peru, Colombia and Brazil
	<p><b>Goal ILAC 6.2 Training and capacity building of human sources</b></p>			
	1. Eradicate illiteracy and ensure universal enrolment in primary and secondary education.	Primary education enrolment		Review, in each country, the feasibility of reporting the indicator
	2. Build capacities to address vulnerabilities in the region	National Emergency or Prevention of Disasters Commissions, by province, canton, district		Costa Rica will circulate the final sheet for comments
	3. Establish, for the public and private sectors and for the community in general, programmes for capacity building in sustainable development management.	Formal environmental education programmes	Revise the indicator	Costa Rica will propose the new methodological sheet.

<sup>(7)</sup> At the TAC meeting on 6 July, work in this area was not assigned to any of the participating institutions because it is not an area that can be measured by using geospatial information and earth observation systems.

Matrix of the ILAC Working Group commitments				
Thematic Area	Goal	Indicator	Comments	Decision
	<p><b>Goal ILAC 6.3 Evaluation and indicators</b></p> <p>Develop and implement an assessment process to follow up the progress made towards attaining sustainable development objectives, including the results of the Johannesburg Plan of Action, adopting national and regional sustainability indicators that respond to the nation's unique social, economic and political features.</p>	<p>Reports on the state of the environment</p> <p>Environment Statistics System</p>	<p>Sheet finalized</p>	<p>Costa Rica leads the follow-up of the indicator</p>
	<p><b>Goal ILAC 6.4 Participation of society</b></p> <p>Create and strengthen participation mechanisms to deal with sustainable development issues, with representatives from government, non-governmental organizations and major groups in all countries of the region.</p>	<p>National sustainable development councils</p>	<p>Sheet finalized</p>	<p>Costa Rica leads the follow-up of the indicator</p>



## **Annex IV**

### **Draft 2006-2008 Work Plan of the Technical Advisory Committee (TAC) on Geo-Spatial Information and Earth Observation Systems**

#### ***I. Background***

1. In the Fifteenth Meeting of the Forum of Ministers of the Environment of Latin America and the Caribbean (Panama City, Panama; November 2005), the Ministers of the Environment of Latin America and the Caribbean decided to establish a Technical Advisory Committee (TAC) to facilitate the mainstreaming of spatial data management and Earth Observation Systems (EOS) technologies into regional environmental decision- making processes. Coordinated by the Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC) on behalf of the Government of Panama, the Technical Advisory Committee was tasked with the implementation of the following activities:

- a) Establishment of a platform to share information among countries and institutions with a high capacity to manage satellite information and other geospatial applications;
- b) Assisting countries without this capacity to build the same;
- c) Creation of concrete products, such as inventories of the geospatial information generators and users and a Regional Atlas of environmental change in order to increase knowledge about the usefulness of geospatial information for decision- making.

2. Progress the implementation of such activities is being presented at the XVI Ministerial Forum in the Dominican Republic in January 2008. The Committee has been convened twice in 2007 in Panama, with participation from the following institutions: Autoridad Nacional del Ambiente de la Republica de Panama (ANAM); Buccoo Reef Trust of Tobago; Caribbean Environment Programme of the United Nations Environment Programme (UNEP- CEP); Centre for Geospatial Studies, University of the West Indies (UWI- CGS); Centro del Agua del Trópico Húmedo para América Latina y el Caribe (CATHALAC); Centro de Levantamientos Integrados de Recursos Naturales por Sensores Remotos (CLIRSEN) de Ecuador; Centro Internacional de Agricultura Tropical (CIAT); Comisión Nacional de Actividades Espaciales de Argentina (CONAE); Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO); Instituto Nacional de Estadística Geografía e Informática de México (INEGI); Instituto Nacional de Pesquisas Espaciais de Brasil (INPE); Global Resource Information Database of the United Nations Environment Programme (UNEP GRID Sioux Falls); Regional Office for Latin America and the Caribbean of the United Nations Environment Programme (UNEP/ROLAC); University of Costa Rica (UCR)

## ***II. Strategy and Objectives***

3. The Technical Advisory Committee operates under the auspices of the UNEP, and in coordination with the regional Environmental Indicators Working Group established by the Ministerial Forum.

4. To fulfill its ministerial mandate, the Committee will, coordinated by CATHALAC and with the support of relevant entities from across Latin America and Caribbean, work toward the fulfillment in the long- run of following overarching and overlapping goals:

- a) Mainstreaming of spatial data and EOS technologies in the environmental decision- making processes across Latin America and the Caribbean, by ensuring the use and adequate application of such technologies by the Ministers and Environment Authorities of the Region;
- b) Support environmental planning and management by providing countries of the Region with access to standardized and reliable geospatial data and information;
- c) Use the products of geospatial science and EOS to monitor on a regular basis and assess the thirty- eight (38) environmental indicators agreed to under UNEP's Latin American and Caribbean Initiative for Sustainable Development<sup>(8)</sup> (ILAC).

## ***III. Activities***

5. Decision 11 of the Fifteenth Meeting of the Forum of Ministers lays the framework for the activities to be conducted by the Technical Advisory Committee. The activities of the TAC are as follows:

### **A. Assist in capacity- building for countries that need it**

6. Recognizing that across the LAC region there are countries in which the use of geospatial science and EOS technologies is advanced, perhaps the most important function of the Committee will be assisting in the development of capacity in countries which lack it.

***a) Conduct a rapid assessment of both existing capacity (human capacity, existing data, software, hardware), and the needs of the countries in the Region***

7. A rapid, regional assessment of existing capacity in the use of spatial data and EOS is absolutely crucial. Not only will the process point out gaps in capacity, but it will also identify those countries and institutions which possess the capacity and interest to assist countries at a lower level of spatial technology development.

8. The definition of 'capacity' can be illustrated as follows: it is noted that the successful application of spatial data and EOS technologies requires not only knowledgeable personnel, but also access to data, and adequate software and

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<sup>(8)</sup> The 38 environmental indicators addressed by ILAC are grouped into guiding objectives: biodiversity, water resources, vulnerability in human settlements and sustainable cities, social issues (health, poverty, inequity), economic aspects (trade, production pattern, consumption), and intuitional aspects.

hardware infrastructure. The proposed user needs assessment must therefore accurately reflect the current state of capacity in the LAC region in such terms.

**9.** In the area of capacity- building, evaluations are being carried out by Centro Geo and INEGI in the areas of user needs and training options. The results of these will serve to inform future interventions in building regional capacity in the use of such technologies.

**10.** In terms of institutions to be surveyed and involved in this initiative, it is recognized that the respective Ministries of the Environment will serve as national focal points. However, it is also acknowledged that a broad base of stakeholders is involved in the process of spatial data infrastructure development, apart from the roles played by governmental institutions. These include, but are not limited to: i) Educational institutions; Donor agencies and other international cooperation agencies (e.g. GEF, IDB, USAID, World Bank); Non- governmental organizations (NGO); Private sector entities (e.g. ESRI); Research institutes; Space agencies (e.g. CONAE, CSA, INPE, NASA, NOAA).

***b) Develop short courses to strengthen regional capacities***

**11.** In line with the gaps identified by the user needs assessment, the Committee will facilitate the development and delivery of a number of short courses (i.e. 1- 2 weeks) in areas fundamental to the successful application of spatial information and EOS technologies. The following list spans the range of current applications of such technologies: i) Basic spatial data analysis; ii) Data sharing protocols and metadata management; iii) Geodatabase development; Environmental modeling (e.g. modeling of erosion, pollutant concentrations, and land use change scenario modeling); iv) Decision- support tool development; v) Internet mapping; vi) Image processing; vii) Satellite image and aerial photo interpretation; and viii) Three dimensional (3D) environmental visualization and simulation.

***c) Organize events for experience- sharing (e.g. meetings, workshops, symposia) in the area of the application of spatial data / satellite technology***

**12.** In addition to current training courses, other activities aimed at sharing experiences and best- practices are essential to the development of a community of users applying spatial data and EOS to environmental management across the LAC region. Support should be provided for the convening of meetings, workshops and symposia at which representatives can present on how they are applying or plan to apply such technologies in environmental management.

***d) Develop a Work Plan with the assistance of the LAC Ministries of the Environment to fill gaps identified by the rapid user needs assessment***

**13.** , in order to fill gaps identified in the user needs assessment, a comprehensive **Work Plan** will be developed with the assistance of the LAC Ministries of the Environment. Such a Work Plan will outline prioritized actions to be taken to build the capacities of countries which lack it.

***e) Develop alliances with data, software, and hardware providers to assist countries lacking in those capacities***

14. It is noted that many developing countries lack both access satellite data and adequate technical infrastructure (software and hardware) to exploit geo- science and EOS. Alliances will be sought with providers of data, software, and hardware to provide discounted products to countries in need.

**B. Establish a platform to share information among countries and institutions with substantial capacity to manage satellite information and other applications**

15. Various countries and institutions of the Region have substantial capacity in terms of spatial data and EOS. These capacities exist in the form of knowledgeable geospatial and remote sensing specialists and scientists, large collections of referenced environmental data (in- situ and remotely- sensed), software and hardware required to collect, process and analyze such data, as well as access to training materials. What is currently lacking is a platform which integrates existing initiatives. The TAC will therefore seize upon existing capacities to develop such an accessible, region- wide platform. This will likewise assist countries just developing their capacity to exploit geospatial science and EOS.

***a) Reach an agreement between the countries (via the respective Environmental Ministries) regarding types of spatial data which are considered basic to environmental analysis and therefore in the public domain***

16. To begin to the address the need for access to regionally- harmonized and referenced environmental data, a significant task that must be undertaken is the definition of those environmental datasets which all countries agree should be publicly available. These are referred to as "framework data." UNEP and the Ministries of the Environment will reach an accord on what constitutes these framework datasets, developing a list of these layers through consensus.

***b) Make national framework data layers publicly available***

17. In pursuance of the aforementioned accord, the framework data layers will be passed from the respective Ministries of the Environment to the TAC to be placed in the information dissemination platform to be developed. The Ministries will also have the option of placing in the public domain other datasets that they would like to share but which are not a part of the approved list of framework layers.

***c) Compile existing, publicly accessible spatial data and satellite imagery for the region***

18. In addition to framework data layers to be obtained from the countries, other publicly accessible sources of data for the region will be obtained. For instance, large databases of freely accessible satellite imagery on a global scale (e.g. the Global Land Cover Facility) and a regional scale (e.g. SERVIR) will be accessed to contribute to the development of a regional database of spatial datasets and satellite imagery. Other public domain regional- and sub regional- scale databases

and datasets (e.g. the Reefs- at- Risk in the Caribbean database) will also be obtained for the regional database.

***d) Standardize and harmonize existing spatial datasets of the region***

**19.** Spatial datasets from a host of different sources will inevitably conform to different standards (i.e. different geographic reference systems, different attributes, different scales, etc.). In some cases, topologic cleaning will need be performed.

**20.** Thus, to ensure that datasets can be directly compared between countries, framework data layers in particular will be harmonized to possess the same attributes, and scales. All datasets will be stored in a common geographic reference system (e.g. World Geographic System 1984). All datasets will have to be accompanied by metadata (i.e. descriptions of the data) corresponding to a widely-accepted standard such as ISO or FGDC.

***e) Develop a regional catalog of metadata to document existing spatial data and satellite imagery***

**21.** Metadata accompanying the data collected for the region will form the part of a regional catalog of metadata. In addition, other metadata records (where available) will be obtained to populate this metadata catalog. For instance, a number of data providers might not want to publish all of their data or provide these directly to UNEP or the Technical Advisory Committee, particularly as it applies to confidential datasets. Development of a regional metadata catalog will still provide data providers with the opportunity to make prospective users aware of their data collections. A marine researcher looking for spatial data on Nassau grouper spawning aggregations will, for example, be able to query the regional catalog and receive the contact information for the GIS Database Manager at CONABIO in Mexico who manages such data. She can then contact CONABIO directly to negotiate data acquisition.

***f) Develop a platform to make available spatial data / satellite imagery the Region***

**22.** Using input from the aforementioned user needs assessment, an integrated platform will be established to provide access to spatial data, metadata and satellite imagery of the region. A major component of the platform will be a regional database containing the spatial data, metadata and satellite imagery compiled from the Ministries of the Environment and other sources. Information from the user needs assessment will help UNEP and the TAC to better design and deploy an integrated system to effectively address UNEP's environmental indicators for the Latin America and Caribbean region.

**23.** In terms of system architecture, the platform will be a web- based, integrated system not only containing spatial data / satellite imagery, but also dynamic online maps, decision- support tools, and environmental visualizations. Such a system has already been prototyped for Mesoamerica through the Regional Visualization and Monitoring System (SERVIR), implemented by CATHALAC with support of NASA and USAID. A viable option is the expansion of SERVIR to the rest of the Latin America

and Caribbean region. A concept paper for how SERVIR could be expanded to the broader LAC region has already been drafted, with limited circulation.

### **C. Generate concrete products demonstrating the utility of spatial data to decision- making**

**24.** Fully in line with the Technical Advisory Committee's goal of developing regional capacity in the use of spatial data and Earth Observation Systems (EOS), the Committee will work toward the development of concrete products with which to demonstrate to the broader public the usefulness of spatial data / EOS to decision- making processes in the region.

#### ***a) Develop an inventory of spatial data users and providers within the LAC region***

**25.** Either as part of the user needs assessment to be conducted or separate from, the range of spatial data providers and users across the LAC region will be inventoried. Such an inventory will shed light on the range of possible uses of spatial data / EOS and on the types of data / information available, as well. Presented in the correct form, the results of the inventory can serve to develop public awareness of the current usefulness and capabilities of geospatial science and EOS.

#### ***b) Develop an Atlas of Regional environmental changes using readily available data***

**26.** UNEP's 2005 'One Planet Many People: Atlas of Our Changing Environment' presented many examples of environmental change, using examples from across the globe. Particularly highlighted in this Atlas were how satellite imagery such as LandSat could be used to illustrate drastic land use changes across the period of a few decades. The data utilized by UNEP were publicly available imagery from the 1970s through 2000 acquired as a part of NASA's Data Buy program.

**27.** In complementarity with the UNEP global atlas, the regional Technical Advisory Committee will similarly develop an atlas illustrating environmental changes across the LAC region. Readily available data for the region – including the global LandSat collections available from the GLCF – should be used to prepare such an Atlas. Other spatial datasets will also be included to illustrate environmental changes. For instance, a small, freely- accessible time- series (2000- present) exists of ocean-color (from the MODIS data).

#### ***c) Conduct applied studies to use and to validate spatially- based simulation models***

**28.** Crucial to mainstreaming the use of spatial data and EOS technologies will be their use in small, applied studies. Every single country in the region already has concrete examples of how these technologies have been used to some extent in decision- making. In some countries, their application is much further advanced than others. Other examples exist at where, at the sub- regional level, the use of these technologies is being pushed. For instance, work is being begun on estimating pollutant loads in the wider Caribbean. In Mesoamerica, the Regional Visualization

and Monitoring System (SERVIR) distributes data on a daily basis illustrating patterns of harmful algal blooms, for the purpose of assisting fisheries management.

**29.** It is proposed that the Technical Advisory Committee will facilitate a number of studies across the region where spatial technology is applied to solve concrete problems. It is anticipated that these can be applied on a case by case basis, at local and regional scales, with representation from across the region. Key in this process will be the collection of in- situ data with which to validate and improve models.

***d) Develop regional, web- based decision- support tools for remote monitoring of key environmental indicators***

**30.** In line with the information platform to be established, and in promotion of mainstreaming of spatial technologies, it is proposed that a number of web- based decision- support tools be developed to contribute to monitoring of key indicators, such as those outlined in the ILAC process. It is noteworthy that a number of region- wide, web- based tools have already been developed and are in use. SERVIR and the University of Maryland are implementing a system whereby users can receive alerts each time fires are detected over a user's particular area of interest. Other systems exist for forecasting and monitoring of flood events in discrete areas of the LAC region (e.g. the Central American Flash Flood Guidance System).

**31.** The Technical Advisory Committee will facilitate the continued development and implementation of such tools. Where possible, tools implemented at the sub- regional level will be expanded to the regional LAC level. This development will, overall, present decision- makers in the broader region with a good understanding of how the Region's environment is changing.

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## Annex V Chronogram

No.	Activity	Timeline						Current Status
		Qtr 3 - 2007	Qtr 4 - 2007	Qtr 1 - 2008	Qtr 2 - 2008	Qtr 3 - 2008	Qtr 4 - 2008	
<b>1</b>	<b>Technical support to regional Working Group on Environmental Indicators (WGEI)</b>							
1.1	Provision of input for revision of Methodological Sheets for ILAC indicators							COMPLETE
1.2	Provision of data on status of relevant ILAC indicators							PENDING
1.3	Updating of data on status of ILAC indicators							PENDING
<b>2</b>	<b>Establish a platform to share information among countries and institutions with substantial capacity to manage satellite information and other applications</b>							
2.1	Convene regional workshop to establish framework and protocols for data sharing platform							COMPLETE
2.2	Development of platform for data sharing							COMPLETE
2.3	Compilation of existing, publicly accessible (coarse and medium-scale) spatial data and satellite imagery for the region							IN PROCESS
2.4	Compilation local-source spatial data from countries for inclusion in data platform							
2.5	Standardization and harmonization of existing spatial datasets of the region							PENDING
2.6	Promotion / training on data platform							PENDING
2.7	Updating of data sharing platform							CONTINUOUS
2.8	Monitoring of use of data sharing platform							CONTINUOUS
<b>3</b>	<b>Assist in capacity-building for countries that need it</b>							
3.1	Conduct a rapid assessment of both existing capacity (human capacity, existing data, software, hardware) and needs of countries in the Caribbean							COMPLETE
3.2	Conduct a rapid assessment of both existing capacity / needs of the countries in the rest of the LAC region							IN PROCESS
3.3	Conduct rapid assessment of regional training options in GIS and EOS							IN PROCESS
3.4	Dissemination of results of rapid assessments							PENDING

No.	Activity	Timeline						Current Status
		Qtr 3 - 2007	Qtr 4 - 2007	Qtr 1 - 2008	Qtr 2 - 2008	Qtr 3 - 2008	Qtr 4 - 2008	
3.5	Develop a Work Plan with the assistance of the LAC Ministries of the Environment to fill gaps identified by the rapid user needs assessment							PENDING
3.6	Investigate alliances with data, software, and hardware providers to assist countries lacking in those capacities							PENDING
<b>4</b>	<b>Generate concrete products demonstrating the utility of spatial data to decision-making</b>							
4.1	Updating the inventory of data users and providers within the LAC region							IN PROCESS
4.2	Regional workshop on the development of the LAC Atlas of Environmental Changes							COMPLETE
4.3	Develop an Atlas of Regional environmental changes using readily available data and imagery, such as was developed globally in UNEP's 'One World Many People' atlas							IN PROCESS
4.4	Conduct applied, local studies for use and validation of spatially-based simulation models							PENDING