

**LOW EMISSION CAPACITY BUILDING PROGRAMME
LECB- Chile**

**Report from the Latin American
Workshop on National GHG Inventories
Systems**

**15 - 17 of May, 2013
Santiago de Chile**



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Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety



Australian Government
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SUMMARY

This report offers a general summary of the **Latin American Workshop on National GHG Inventories Systems** that took place between the 15th and the 17th of May 2013 in Santiago, Chile. The workshop was organized in the context of the Low Emissions Capacity Building programme (LECB) implemented by the Ministry of Environment of Chile (Ministerio del Medio Ambiente de Chile, MMA) with the support of the United Nations Development Programme (UNDP) and with the collaboration of the IPCC's Technical Support Unit from the Task Force on National Greenhouse Gas Inventories (IPCC TFI-TSU) and relied on the participation of more than 60 experts from Argentina, Chile, Colombia, Costa Rica, Ecuador, México, Perú, and Trinidad and Tobago.

The first day of the workshop was focused on the implementation and the development of National Inventory Systems (NIS) for Greenhouse Gases (GHG) and included presentations about: the LECB Programme and generalities about the NIS; support tools for the NIS (like schedules of work and the software ALU) of the United States Environmental Protection Agency (US-EPA); statistical data bases of the Food and Agriculture Organization (FAO); a Latin American Network on National GHG Inventory Systems; and finally the experiences on the implementations of NIS in Chile, México, Colombia and Costa Rica.

The second day was focused on the training in National GHG Inventories carried out by members of the IPCC TFI-TSU, who trained the participants of the Latin-American countries in the IPCC 2006 Guidelines for the National GHG Inventories (GL2006) and the use of the Software of the IPCC for the elaboration of National GHG Inventories, in its 2.11 version.

During the third day, the training in the development of the National GHG Inventories by the IPCC TFI-TSU continued, to finalize the workshop with a plenary closing session during which the principal comments, observations and commitments of the three days were underlined:

OBJECTIVES OF THE WORKSHOP

The objectives of the Latin American Workshop on National GHG Inventories Systems were the following:

- Increase the capacities at the governmental level in the elaboration of National GHG Inventories through the implementation of robust NIS,
- Consolidate a network of south-south multilateral cooperation for the creation and maintenance of capacities around the National GHG Inventories at the Latin-American level, and
- Basic training in the elaboration of National GHG Inventories under the most updated IPCC tool to support the design of NIS.

EXPECTATIONS

The expectations exposed by the participants of the workshop included, among others: consolidate the experience to face the problems of compatibility and comparability between the different IPCC Guidelines and methodologies for the elaboration of National GHG Inventories; and create capacities for the implementation and the institutionalization of NIS in order to face the future elaboration of the Biennial Update Reports (BUR) and the National Communications (NC).

WORKSHOP DEVELOPMENT

Day 1 – National GHG Inventories

Low Emission Capacity Building Programme: A global initiative to support mitigation actions / Overview of National GHG Inventory Systems

Kimberly Todd (PNUD)

Summary

The objective of the LECB¹ programme is to develop capacities to design and implement low emissions development strategies and national mitigation actions in the public and the private sector: The components of the programme are; NIS, NAMAs, LEDS, MRV y mitigation in selected industries.

Currently twenty-five countries are part of the programme, representing five regions of the world. This programme started in January 2011 (phase 1) with fifteen countries. Then, in January 2012, after additional contributions of the donor countries, ten additional countries joined in.

It should be pointed out that the programme focuses on the design and the implantation of a National GHG Inventory Systems (NIS) and not on the preparation of a National Inventory in particular.

A strong and solid inventory is fundamental to generate a basis on which decisions can be taken to be able to evaluate different measures, like NAMAs, LEDS, MRV and whichever action of mitigation.

These systems have to be able to provide sufficient information for the decision makers, investigators and the general public at regular intervals every two to four years. To achieve this, it is necessary to count on institutional arrangements that allow the allocation of resources to ensure the functioning of the system and consolidate the basis that regulate the system itself.

Relevant comments and observations

AFOLU is considered to be the most difficult sector for developing the NIS, due to the complexity of collecting data, which is why it is recommended that the development of capacities focuses on this sector. In addition, the Quality Assurance and Quality Control (QA/QC) system has to be a continuous process and a priority for the sensitive areas where there could be major uncertainties.

Considering that some countries are preparing their NC and they need to develop the first BUR in roughly the same timeframe, it is fundamental to merge the systemization of elaborating the NIS as well as working on the BUR in parallel. In order to accomplish this, timing and systematizing are key

¹ Más información en: <http://www.lowemissiondevelopment.org/>

aspects. It is very important to streamline as many aspects as possible, as the timeframes are short between the two, considering the BUR is meant to be an interim update between NCs.

Chile opted for focusing efforts on coordination and, through the different funding programs, to address different areas to cover as much as possible. The application for funds for the 3rd NC focused on Vulnerability and Adaptation; the LECB programme focuses on the NIS and the BUR is being used to address Mitigation. Given that the deadline windows between the first BUR and the third NC of Chile are very short, it is possible to assign funds in coordination to face the totality of the spectrum that will benefit those two reports.

In Latin America, the major strength for developing BURs and implementing NIS is the expertise gained by countries that have developed their NCs. The major opportunity consists of the cooperation between the countries to share this expertise.

Setting up a Sustainable National GHG Inventory System

John Sottong (US-EPA)

Summary

To assist the development of NIS, the US Government has developed work templates to systematize the information within the NIS that aides selected developing countries. These templates focus on a wide range of critical points within the NIS and can be applied and modified to address each country's specificity. They are an organizing tool that helps with the NIS continuity because they create transparency, consistency and comparability. Also, they create an institutional memory regarding procedures, which can reduce future costs.

The templates focus on Institutional Arrangements, Methodology and Data Documentation, QA/QC, Archiving System, Key Category Analysis and the NIS Improvement Plan.

Relevant comments and observations

So far, countries that have used or are currently using the templates in Latin America are Colombia and Costa Rica.

The time needed to develop a NIS will vary according to the national circumstances. However, if there has been previous work done on inventories and on institutional arrangements, time can be reduced considerably.

Outsourcing sector inventories to external consultants poses no relevant problem if specific Terms of Reference are elaborated that will ensure positive results and a clear understanding of responsibilities. External consultants should also document their work using the templates in order to benefit from them.

However, the templates are very useful to aid in planning and scheduling according to country limitations and prioritization; therefore, it is important that whoever carries out the work using them should belong to the permanent staff body or should have a direct relation to the process. It is worth mentioning that external consultants destined to elaborate the inventories can vary inventory to

inventory, which can cause a disruption on the methodology used and delay the learning curve for the templates.

To access formal help from the US Government, there are several steps to consider. First, there is a Scoping meeting and a Sector Questionnaire to determine the feasibility of transferring resources. These questionnaires focus on the institutional arrangements that will allow the work to be successful and permit the personnel sent by the US to carry out their work. In some cases, the first part of assistance will be setting up the arrangements necessary and then moving into the technical assistance with special attention regarding the templates.

To address the cooperation of the private sector, the US has a mandatory reporting programme for companies who emit over 25,000 units of CO₂ per facility. Nonetheless, it is still a work in progress, and depends on the sector relationships and how to incorporate the data to the methodology or use the IPCC guidelines. Confidential agreements can also prove to be a valuable resource when dealing with the private sector.

When developing a NIS, it is important to have in mind that the coordinator needs to be able to assess how the institutions work around the matter and how to best engage in data collection. This will always be country specific as each sector has different resources available for carrying out inventory related tasks.

The process of developing a report should include constant QC at all the phases of reporting an inventory; the QC should be done by the inventory team. It is recommended that QA of the draft documents be sent to external sector experts to determine the veracity of the information and methodologies used before they are finalized. Once the report is made public, it is suggested to receive comments from interested parties and assess their input.

Regarding the collection of inventory data using a bottom up approach, there are several elements to keep in mind. For example, it might be too ambitious for a country to use this approach as it is more suitable for private companies, considering that the control of resources and decision making is more direct. Also, the timeframes for elaborating these private inventories are different and may not be scalable to the level it needs to reach. However, it is country specific and it could work in specific situations.

The templates provide an accurate approach to the NIS regardless of the methodology used, be it IPCC 1996, 2000, 2003 or 2006 because they are neutral, allowing applicability on all the methodologies so far. Some tools might need to change between each guideline, but the overall NIS is more than adequate throughout.

ALU Software: Inventories of GHGs for Agriculture and Land Use

Mihaela Secieru (US-EPA Consultant)

Summary

ALU Software (ALU SW) is a tool developed to help on the process of communicating GHG emissions to the UNFCCC. It was created using the 1996 IPCC Guidelines and the 2003 Good Practice Guide and focuses on Tier 1 methodology, but can be used for Tier 2 as well.

The SW by itself is a relational database that allows the use of Geographic Information System (GIS) from remote sensing images to incorporate land use and land use change data. Also, it facilitates the mitigation analysis related to the inventory, comparing good practices with the referenced emissions.

Relevant comments and observations

Compatibility and comparability between ALU SW and the new UNFCCC SW is possible as the SW allows for exporting data on the UNFCCC format and will be updating constantly to maintain this capability. However, the possibility to export to the IPCC SW is currently being discussed.

The SW will be updated to use the new 2006 IPCC Guidelines from 2006 as NAI Parties will be forced to use these, but for the time being it is not a priority.

Considering that ALU SW permits mitigation analysis, the inclusion of support for importing from the IPCC software to allow this functionality and including an analysis to compare different mitigation actions will be further developed in the future, considering there is substantial interest. Also, it is suggested to allow comparability of mitigation actions and results between different areas.

The software permits the inclusion of new categories other than the template ones and is SIG ARVIEW compatible.

The FAO Emissions Database

Francesco Tubiello (FAO)

Summary

FAOSTAT has launched an inventory section on their database and was made publicly available. It is based on supporting the global and regional evaluations as there is no international agency that reports GHG emissions for the AFOLU sector. It also poses as a tool for NAI Parties to fill the data gaps within their inventories and carry out QA/QC.

Relevant comments and observations

However, some discrepancies between data reported by FAO and the data collected by the national inventory teams have been documented. Therefore, the FAO data should not be taken as a infallible source of data. Countries should cooperate to improve this and appraise where and why these differences appear.

FAO is interested in receiving accurate data that contains the variations found by countries in order to provide data that is consistent with that reported by the countries in their NCs and BURs.

Worth mentioning is that the uncertainty level is calculated using the IPCC guidelines and countries should only report raw activity data. FAO can carry out a follow up on the information reported and

can track the data to the origin of the information. The reporting is done in such a way that the origin can be determined to the specific agency that works with FAO providing the data.

Latin-American Network on National GHG Inventory Systems

Paulo Cornejo (MMA)

Summary

Considering the decisions of the COP 16, which determined non-annex 1 Parties, should produce a BUR and those of COP 17, which determined that countries should report their first BUR by 2014, NAI Parties are in a rush to develop their NIS to update their National GHG Inventories at regular intervals to comply with their commitments made to the UNFCCC.

According to the workshop participants, the major challenges at the regional level are: institutional arrangements, personnel turnover rate in government positions, activity data availability and collection, insufficient funding, political awareness and disposition and low technical capacity. On the other hand, the major advantages and opportunities identified within the region were the experience between nations on elaborating their NC and a considerable number of experts with knowledge on climate change. Therefore, the creation and implementation of multilateral cooperation south-south is proposed in order to develop and maintain capacities regarding GHG inventories for the Latin American region with the following objectives:

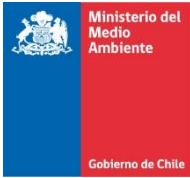
- Create a knowledge based on the past, present and future work of member states.
- Identify the needs for cooperation at national and sectorial levels between member states.
- Identify cooperation opportunities at national and sectorial levels between member states.
- Facilitate the bilateral- and multilateral communication between member states.
- Facilitate activities on capacity building and maintenance between member states.

Chile considers that this workshop is an activity directly related to the eventual network as a starting point and it is now the duty of each member state to be able to define the common grounds for the network to function on, as well as the next activities and financial mechanisms to be proposed.

Relevant comments and observations

One way for addressing the creation and implementation of the network is to coordinate a system at the technical level before elevating the request to the political level. This, because the technical actions required must be considered at the short-term in order to comply with the dates established by the UNFCCC, whereas the mid- and long-term results of the network can be addressed at the political level. However, political backing must be considered in order to have access to funds and resources.

The funding required for the implementation and maintenance of the network is still undetermined as it is directly related to the activities proposed, as this early stage is for outlining the possible next steps. It is suggested that the following steps are related to LECB, since its objective is to develop regional capacity, something the network would provide.



Sistema Nacional de Inventarios de GEI – CHILE

Oficina de Cambio Climático
Ministerio del Medio Ambiente

While National GHG Inventories create a common language that can help multilateral cooperation among countries on scientific and technical level, the challenge beyond building capacity for the development of inventories or NIS, is to effectively communicate scientific and technical knowledge at political levels, so that climate change may have greater relevance for decision makers.

It is suggested that the network should be an instance for each country to communicate their progress in developing its National GHG Inventories, identifying possible failures and possible solutions together. To begin, it is recommended as a first step to diagnose certain specific areas on the strengths, challenges and part of the construction and implementation of the NIS process each country is on.

Chile has agreed to send a list of national experts and workshop participants to the countries so they can know who to contact if they have any questions. Also, other countries were urged to exchange a list of their national experts to begin the knowledge base exchange.

Regarding the internal communications within the network, the US-EPA templates were suggested as they present a standard format with no confidential information. Lastly, the use of internet communication via webinars was suggested to facilitate the interaction between the participants.

Day 2 – Training on National GHG Inventories

Introduction to the IPCC and its Task Force on National Greenhouse Gas Inventories / Introduction to the 2006 IPCC Guidelines

Kiyoto Tanabe (IPCC TFI-TSU)

Summary

In recent decades, climate change has taken a key role in international politics. Within this framework and in order to control climate change, it is crucial to limit GHG emissions. To control the emissions, they need to be estimated, and for this national GHG inventories can effectively evaluate which ones, how much and how you can control them. The methodologies developed by the IPCC fulfill this function of estimating GHG emissions at a nationwide level.

The IPCC provides scientific, technical and socio-economic information for decision-makers regarding climate change. It was established by the World Metrology Organization (WMO) and the United Nations Environment Programme (UNEP) in 1988. Much of the work of the IPCC consists in developing guidelines for National Greenhouse Gas Inventories and is focused within the Technical Support Unit (TSU) of the Task Force on National GHG Emissions Inventory (TFI) in Japan. In order to adapt the developed methodologies to be applied in any country, these have been divided into three levels of complexity and precision.

Relevant comments and observations

For the AFOLU sector, it has been shown that although the Tier 2 methodologies are more accurate, Tier 1 estimated results are not significantly different from the ones calculated with Tier 2, making Tier 1 inventories as valid as the one developed with a Tier 2 methodology. This is important because it demonstrates the validity of inventories of NAI Parties (developing countries) and their efforts.

Approaches to Data Collection

Tiffany Troxler (IPCC TFI-TSU)

Summary

To develop inventories, data collection methods that allow to develop a robust inventory are essential and specific procedures for data collection that can be replicated consecutively must be established. Data collection should be able to evaluate not only the data, but the uncertainty associated with them and the different methods have different aspects to consider.

There will be different sources of activity data depending on the sector and this also varies country to country. Even when dealing with the private sector, there are complications, such as confidentiality and uncertainty of the origin of the data, issues that must be rectified in a case by case scenario.

Relevant comments and observations

One of the differences in the management of the activity data between the IPCC guidelines is the grouping of the data (for example: in Agriculture, if using the IPCC GPG 2000 Guidelines, activity data is averaged over three years, whereas while using the IPCC 2006 Guidelines, the activity data corresponds to the precise year data). Originally, this method was used to avoid the impact of outliers, but in practice this does not significantly affect the results therefore the use of averages is not necessary. However, this will also depend on how the data was obtained and estimated. In case data is missing and must be generated, then averaging from previous years would be considered prudent.

Another method to generate data are surveys, which should be developed specifically for each sector. These, if designed properly, can provide better data than a census, depending on the frequency between them. Good surveys every three years could be considered better than a census every ten years.

Regarding time series and the statistics' frequency, the most appropriate techniques should be considered to estimate previous data as well as the years to be backwardly assessed and these depend directly on the methods used. However, regardless of which method is used, the data must be able to provide annual estimates.

Uncertainty Analysis in Emission Inventories

Baasansuren Jamsranjav (IPCC TFI-TSU)

Summary

To develop inventories that portray reality, we need to estimate the uncertainty of the data collected. Even simple calculations, if well executed, can provide relevant information on the statistical errors. For this to happen it is necessary to incorporate the required parameters for the estimation as part of the data collection. This should be planned within the activities of collecting and analyzing data to avoid over- or underestimating of the uncertainty.

Key Category Analysis

Nalin Srivastava (IPCC TFI-TSU)

Summary

Considering a specific category of an inventory may have little impact nationally and that resources are limited, it is important to target those resources on categories that produce the greatest impacts. In other words, consider those that are most significant to the emissions trend. To assess which categories are most relevant, it is necessary to implement a key category analysis (KCA). However, it is recommended that at least a Tier 2 methodology is used with these analyses.

There are two types of KCA: a) Quantitative, which evaluates numerically the contribution than one category makes to the national total and b) Qualitative, which considers other criteria that cannot be evaluated quantitatively.

Relevant comments and observations

The IPCC SW uses quantitative analysis, but does not impose this type of analysis to perform the inventory and the final report can be completed with information from a qualitative analysis. However, when qualitative analysis is used in sectors with little information, the expert judgment used must be well corroborated to avoid inconsistencies in the estimates and analysis.

It is very important to always consider the work done outside the analysis, such as data collection, as the consistency of the input will impact the estimated result.

Time Series Consistency

Baasansuren Jamsranjav (IPCC TFI-TSU)

Summary

An inventory cannot be considered as the estimation of a single year, but the estimation across a number of years to assess a trend and the effects of emission reduction strategies. These should always be compared to each other and should reflect the actual emissions and sinks.

Considering that you can't always collect all the data, there are a number of statistical techniques to generate new data. These are splicing techniques and the 2006 IPCC Guidelines suggest using Overlap, Surrogate Data, Interpolation and Extrapolation.

Relevant comments and observations

Extrapolation should not be used when the trend is not constant over time. If there is no consistent trend you must perform other methods and compare them to find the best and most accurate according to expert judgment. Furthermore, a linearity test may be performed for determining whether or not there is a consistent trend.

Different statistical techniques should be used in case there are different methodologies used between the time series sets, since the methodologies may not be compatible. However, if there is a significant difference between the methodologies used, the newest or most advanced methodology should be used to recalculate the incompatible inventories so they can be compared. This has been found to happen frequently in developing and transition countries who improve their statistics and NIS.

A problem of estimating data is that the respective sectors may not agree with or have different data for the same activity than that obtained by the inventory team; even if these estimates are made using an appropriate methodology and are well documented. It is a problem that must be solved by each country separately according to their situation.

Quality assurance / Quality control and verification

Tiffany Troxler (IPCC TFI-TSU)

Summary

Inventories reported by countries to the UNFCCC must be of the highest quality possible. For this, there are five indicators for evaluating the quality of an inventory: transparency, completeness, consistency, accuracy and comparability.

For the correct operation of these indicators and the guarantee of a good inventory, a QA/QC system must be considered. This system should be located within a continuous improvement plan in order to direct resources to the areas that need attention. The resources should focus on areas in need of a more rigorous QC; however, without neglecting the other areas, thus, it can improve the quality of the inventory.

If an inventory is intended to provide the necessary information, it requires a QA/QC plan, specific QA/QC procedures and category-specific QC and QA procedures. It is also essential to have a documentation system designed to track the QA/QC.

Relevant comments and observations

Regarding the comparability between inventories developed with different IPCC methodological guidelines, these are fully comparable globally, but must assess sector-specific differences, especially between Agriculture and LULUCF and AFOLU.

IPCC Tools: Inventory Software and Emission Factor Database

Maya Fukuda (IPCC TFI-TSU)

Summary

To support the development of GHG inventories, the IPCC has developed Software (latest version is from April 2013) which implements the 2006 IPCC Guidelines, but has the advantage of being able to export the inventory results in the format of the UNFCCC report that is required from NAI . Furthermore, the IPCC has a virtual database of emission factors, which are freely available.

Relevant comments and observations

This new SW version 2.11 includes minor improvements in some programming flaws. It also allows the transfer of databases from previous versions of SW.

The SW can be used to make a complete inventory or just focus it on specific areas and contains tools for KCA and uncertainty analysis. Currently, all categories can be evaluated using Tier 1 methodologies, and the IPCC is working to complete the functionality for Tiers 2 and 3.

Training on National GHG Inventories

IPCC TFI-TSU

Summary

After the presentation by the IPCC TFI-TSU, participants were divided into two groups to proceed with specific training in the 2006 IPCC Guidelines and the IPCC SW. These two groups were:

- Group 1: Energy, Industrial Processes and Products Use and Wastes sectors
- Group 2: Agriculture, forestry and other land use (AFOLU) sector

Each group was addressed under its own dynamics and covered the sector-specific issues.

Day 3 – Training on National GHG Inventories & Closing Plenary

Continued specific training in the 2006 IPCC Guidelines and the IPCC SW.

Closing Plenary

Kiyoto Tanabe (IPCC TFI-TSU), John Sottong (US-EPA) and Paulo Cornejo (MMA CHILE) as moderator.

Regional networks are crucial for constructive collaboration, and neighboring countries tend to have similar characteristics or challenges that could be shared with others. The BUR is a challenge for all NAI Parties, therefore starting a network for south-south cooperation would be a good initial step that could be extended to future cooperation in other areas of climate change such as mitigation and adaptation.

To create this network, some design considerations must be addressed, such as the relationship between all the parties towards a common project and the network's organization and coordination of activities. Furthermore, the application would have to follow a certain schedule and require a formal nomination by each participating country. For this the USAID-LEAD program could be used as a framework template.

It is suggested that future activities be framed within the LECB and UNDP programme and even attempt to join country projects that have similar issues.

Main agreements and commitments:

- Chile is suggested as focal point to start the activities and organization of the network until an official appointment has been made.
- Each country should designate a representative for the network.
- Technical personnel must seek government support for funding and official appointment.
- The next activity will be the presentation of lists of experts by sector and by country; Chile will send a list of experts; the list could also serve as a common format.
- Activities should be aligned with the objectives of UNDP and explore the possibility of financing through the LECB programme.
- US-EPA templates could be used for internal communication, as they can help with collaboration by enabling document interchange in a standard format.
- It is suggested to communicate the paths taken to solve problems in the development of NIS and the problems that remain to encourage the development of ideas and learn from the experiences of other countries.

- Make a general country diagnosis to assess how each country is progressing and where each country can help another.
- There must be a secretariat host country which will rotate, as will the meetings.
- It could also focus on capacity building for Human Resources experts.
- A web page must be developed to allow for the creation of networks and advancement control.
- Central American countries should participate as well.

Unresolved issues to address:

- Next activities;
- Funding;
- Political backing to develop the network; and
- If cooperation will elevate the importance of climate change for decision makers.

In order for the Latin-American Network on National GHG Inventory Systems to be successful, it is suggested that participants should seek to keep in contact after the finalization of the workshop to further explore the possibilities for generating the network and fine tuning of the action plan to move forward in officially establishing the network.