



The 6th International Conference on Life Cycle Management in Gothenburg 2013

## **CHILEAN FOOD & AGRICULTURE LCA DATABASE USING UNEP/SETAC SHONAN PRINCIPLES**

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*Keywords: Chile; Food; Agriculture; Life Cycle Inventory; Database; Shonan Principles*

### **ABSTRACT**

The Chilean Food & Agriculture LCI Database project plans to deliver the following components by 2015/16:

1. LCI/LCIA Methodology: Define the criteria to develop baselines models (BLM), LCI data sets, and impact assessment methods.
2. LCA Tools and Information Platform: Provide BLM's, LCIA Calculators, and best practice industry data

It is also recognized that there is a need for data collection tools to be practical and efficient to use for different kinds of users, such as small farmers and large food companies, users from government, and consultants.

To create an approach with high usability and harmonization, this project is being aligned with international guidelines including UNEP/SETAC Shonan Principles, Sustainability Consortium's Sustainability Measurement and Reporting Systems (SMRS®), and the World Food Database.

### **BACKGROUND**

The Chilean Food & Agriculture life cycle inventory (LCI) database is a call from the results from the recent ProChile (2012) study "State of the Art in Sustainability Matters at a National and International Level" found that the current level of implementation of sustainability measurement tools (incl. carbon, water, energy, etc.) in Chile is relatively low. To improve performance and increase efficiency, it is necessary to measure impacts and establish indicators in order to identify a baseline for monitoring progress across the supply chain and to anticipate major vulnerabilities associated with production.. In Chile there is a need to:

- Develop methodologies and tools to involve actors and stakeholders from academia, industry, government, and NGOs. There is no leadership to drive methodological alignment and coordination through production chains to measure and report sustainability performance to standards often required by international markets.
- Provide geo-specific data, collected with a scientific and transparent approach to life cycle assessment (LCA) users around the world, in order to obtain precise and consistent information. This would enable improved product stewardship from



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enterprises and public entities – and the creation of public policies – helping increase the product sustainability and economic activities. (UNEP, 2011)

## **OBJECTIVE**

The objective of the Chilean Food & Agriculture LCI Database is to implement an LCA based information system to facilitate the measurement and reporting of product level sustainability performance to support decision-making of companies in the food value chain,.

The Chilean Food & Agriculture LCI Database will deliver:

1. LCI/LCIA Methodology to develop baselines models (BLM), LCI data sets, and impact assessment methods.
2. LCA Tools and Information Platform with BLM's, LCA Calculators, and leading industry data

## **METHODOLOGY**

Led by the Chilean food industry, the Chilean Food & Agriculture LCI Database intends to provide resources for measuring and reporting the environmental impact for 16 product categories in five groups: (i) Fresh and processed fruits (9 products), (ii) Aquaculture (2 products), (iii) Meat (2 products), (iv) Dairy (2 products) and (v) Wine (1 product) from the Chilean food sector.

IERS, (2012) provided a roadmap consisting of an 8 steps (**Figure 1**) process to develop the national LCI database, including the role of stakeholder engagement, the structure of the tool to manage and update the database and the configuration of the governance body.

An efficient and open access information system will be developed with the food sector for these products. The intention of the system is to give access to end users and allow them to make use of assessment information or communication tools which address the sustainability of its products and traceability of raw materials and inputs used in their production processes. This, in turn, intends to result in a scientifically robust methodology with resources for potential users through a practical and cost-effective way.

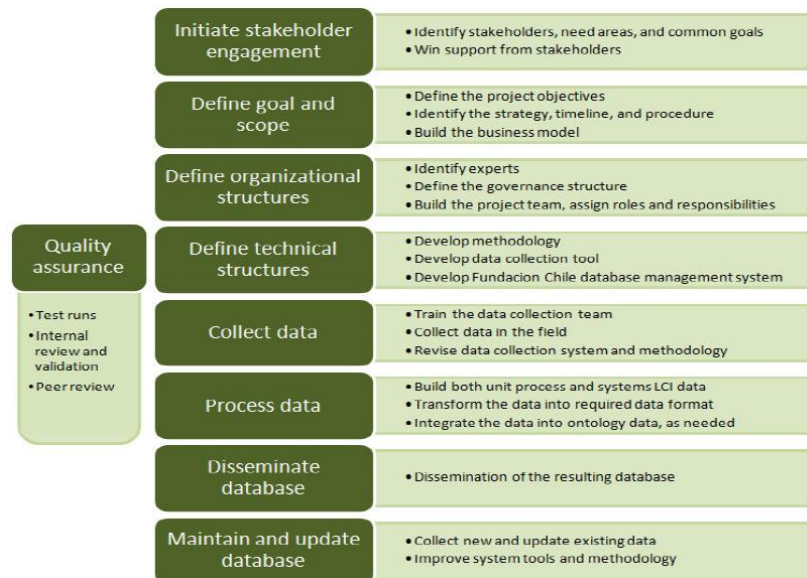


Figure 1: Overall structure of the roadmap toward the National LCI database of Chile

Through this process, the following project components will be delivered:

- Chilean National Life Cycle Inventory (LCI) Data Collection Methodology for data collection and development of inventories, which will be internationally validated and appropriate for the Chilean context. This will include established rules and procedures for the collection, management and analysis of information, allowing the initial data raised by this project to be expanded in the future. This methodology will be aligned with the World Food Database, The Sustainability Consortium’s Sustainability Measurement and Reporting Systems (SMRS®), and Ecoinvent database.
- Chilean National Food and Agriculture LCI Data Sets following the LCI data collection methodology. The LCI data sets from the 16 product categories will provide BLM’s for the database. This data sets will be constructed to fit unit process operations throughout the supply chain (extraction of raw materials, production processes, transportation, etc.), based on literature review and surveys for the most relevant flows in and out of the product system. This will ensure transparent data that could be easily understandable for users, a higher level of flexibility and adaptability to the database and an easier interpretation of LCIA results (UNEP, 2011).
- Chilean National Food & Agriculture Life Cycle Impact Assessment (LCIA) Methodology based on existing best practice methodologies. The adapted Chilean national Food & Agriculture LCIA methodology will be validated and appropriate for the Chilean context.
- Collection of Food & Agriculture Industry Best Practice: In addition to the LCA measurement and modeling tools, indicators of good industry practices associated with the management and selection of inputs will be provided in order to make it possible for the industry users to implement improvements once their hotspots in their supply chain are identified. The information gathered will be a starting point for a process of



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continuous improvement, in the first instance, by using the best information available, and drawing from international case studies and databases.

- A platform with integrated calculators models for each of the selected products to allow the users can compare their performance against national BLM's, modify some parameters associated with their production, and identify the greatest opportunity for improvement across the product supply chain. The platform is also designed so that, in the future, the number of product categories incorporated and new processes and products represented can gradually increase
- Transfer, Dissemination, and Education of Online Platform: Once the platform has been completed, the project participants will be educated on how to begin utilizing the data (i.e. accessing information and reporting results) which, in turn, will strengthen the technical skills of the users while enhancing the database itself.

### **RESULTS TO DATE**

The following key components of the project have been achieved as of mid 2013:

- Stakeholder support: 14 key stakeholder groups have provided signed letters of support for the project, which includes Chilean food product industry associations, the Chilean Ministry of the Environment and international experts in LCA.
- Methodology, Budget and Timeline: A clearly defined methodology has been completed to provide an overall map of the project which includes project budget and a timeline that has set out the project completion fro 2015/16.
- 9 product categories for food products based on literature review and nationally adapted data (electricity grid, transport distances, etc) (Bengtsson et al., 2012)
- Chilean Government Funding Application Submission: The Chilean Economic Development Agency (CORFO) Public Good funding application was submitted in March of 2013. If approved, this fund will provide the complete budget for the deliverables of the Chilean Food & Agriculture Database.
- Database Overview: A conceptual system has been designed which presents issues such as information flows and stakeholder engagement.

### **DISCUSSION**

Although the project is still awaiting notification for the acceptance of the fund, which will be presented by the end of June 2013, the achievements made in the development of the application have still been significant. Strong buy-in for the project has been achieved by a wide array of key stakeholder groups and, if this project does achieve its funding requirements, there is a strong opportunity for pioneering the development of numerous life cycle management resources for the Chilean Food & Agriculture Sector, which includes:

- The identification of the critical points regarding environmental impacts of the sector's products, in order to focus efforts and resources to improve their performance, both production and sustainability.



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- A range of publicly available information on the opportunities for improvement aimed at the main critical points and environmental terms for each product.
- The resources to incorporate the environmental variables of the decision making for the evaluation of suppliers, product or process modification and optimization of resources.
- Facilitate communication with customers and stakeholders, as well as strategic planning and marketing, positioning Chilean products in domestic and international markets, being well prepared for ecolabelling requirements and other sustainability information schemes emerging products.

### **CONCLUSIONS**

The development of an information management system and harmonized database will allow Chilean industry, government and academia to have easy access to good quality information that can be used to establish benchmarks for impacts of products throughout their life cycle, for public policy, and continuous improvement throughout the supply chain.

Sustainability for competitiveness is undoubtedly one of the lines of work the food industry should take to ensure their permanence and economic sustainability, while increasing the confidence of international buyers and further position Chilean products.

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