Development of National LCA Database Roadmaps, including further development of the Technical Helpdesk for National LCA Databases

Deliverable D 2.5b Report on baseline assessment and stakeholder mapping in Uganda

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1.1 Introduction and background

The call for sustainable solutions in all sectors increases day by day both at international and national level. As international calls to implement sustainable strategies at national level continue, countries have to develop strategies based on national data to achieve sustainability solutions. The country specific data will help in the adoption of policies and technologies that promote sustainable consumption and production across different sectors. One of the cornerstones of sustainable solutions, is the promotion and application of Life Cycle Assessment across the different sectors. Comprehensive LCAs provide environmental performance data that is used to understand and act on environmental burdens along the supply chains, thus preventing shifting burdens up or down the supply chain or between environmental impact categories. Countries need LCA data for better and sustainable informed solutions that put the country on a better path of sustainable consumption and production. Uganda is no different in quest for the LCA roadmap that will lay a firm foundation for the establishment of a reliable and all-inclusive National LCA database. For the success of the project, a baseline assessment and stakeholder mapping are therefore crucial in providing status of LCA activities, stakeholders involved and theirs proposals.

1.2 Overview LCA activities in Uganda

LCA activities in Uganda have been taking shape with some researches being done at Universities, companies and individual level. The government has been participating in LCA initiatives through the promotion of LCA standards developed by the International Organization for Standardization (ISO). This has increased awareness among different stakeholders. Formal national LCA training activities started in 2013 with financial support from Swedish International Development Cooperation Agency (Sida) under the framework of "Swedish Standards Institute – East African Community" project on trade promotion through standardization. Different stakeholders were trained on the LCA standards and their implementation. This initiative together with the support from

UNEP/Life Cycle Initiative in 2016 led to the formation of the LCA Network Uganda, which is legally registered under the Uganda laws.

1.2.1 LCA in industry and the private sector

Many sustainability initiatives have been on the rise both in the industry and private sector. The Uganda Cleaner Production Center has been at the forefront of promoting cleaner production initiatives among the industrial sector, while different initiatives have been done in the private sector through startup programs, government and NGOs support. Sustainability initiatives focused on cleaner production have been promoted in Pulp and Paper Manufacturing, Food Processing Industries, Chemicals and Battery Manufacturing, Textile Industries, Metal Industries, Schools and Hospitals, Hotel Industry and the agricultural sector.

However, the specific application of LCA in the industrial and private sector has been low. Major industries have not been involved in the application of LCA except for a few small processors that have since changed their systems based on LCA reports. These include; juice making factories and dry fruit processors. Overall, three factories have been able to change their waste management, energy systems and transportation systems based on the LCA results. Two of the dry fruit processors, Flona Commodities Limited and Rural Community in Development (RUCID), picked interest during LCA workshop in 2013, where they saw it as helpful in their quest to acquire ecolabels since they were exporting their products to the European market, specifically Belgium. On the other hand, Kazire Health Products Ltd the fruit juice factory was encouraged through the promotion of cleaner production methods in the country among small and medium-sized enterprises (SMEs). This paved way for applying LCA as the basis for improving the environmental performance across its supply chain.

1.2.2 LCA in regulations and public policy

The participation of Uganda in different sustainability initiatives has led to its promotion of policies based on SCP. Uganda actively participated in the United Nations Conference

on Environment and Development (UNCED) in 1992 and officially endorsed Agenda 21, the key policy output of the conference: Agenda 21, in Chapter 4, encourages countries to promote sustainable consumption and production technologies.

Following her endorsement of Agenda 21 therefore, Government of Uganda advocated for the introduction of cleaner production methods across all key sectors of the economy. Sustainable initiatives include; Cleaner Production Practices, Sustainable Cities Program, Urban Transport Reforms, Biomass Co-generation, Dissemination Programs on Efficient Cooking Stoves, and Transformation of conventional agricultural production into an organic farming system.

Different sustainability policy initiatives have been put in place covering different sectors. Most of the initiatives have been realized with international organizations support, especially UNDP and UNEP. These include;

- National program on sustainable consumption and production, launched in 2011, by the Ministry of Tourism, Trade and Industry with support from UNEP. The project was coordinated by Uganda Cleaner Production Center.

- The National Development Plan (NDP) 2010/11-2014/15. It emphasizes the need for strong sustainability content in the plan and includes a comprehensive list of environmental stainability indicators in its monitoring and evaluation plan (M&E plan).

- National Development Vision (2035) also emphasizes SCP.

Other National policies in support of sustainable consumption and production include;

- The National Environment Management Policy 1994,

- The Forestry Policy 2001,

- Energy Policy 2002,

- The Renewable Energy Policy 2007,

- The Land Use Policy 2008,

- National Industrial Policy 2008,

- Tourism Policy 2006,

- the National Water Policy (1999),

- The Fisheries Policy 2000,

- The Water Policy 1995,

- The National Wetlands Management Policy 1996

- The Wildlife Policy 1996.

The above national policies are indirectly linked to LCA, since they promote SCP across different sectors. This brings in strong basis for the promotion and advocating for LCA in both private and by the public sector as a way of providing evidence based approach to policy changes, on the basis that LCA provides comprehensive life cycle perspective of environmental performance.

Other major pilot projects supported by government and promoting Sustainable Consumption and Production include;

- Demand-side Management on Energy Use,

- Demand-Side Management on Water Use and Water Harvesting,

- Integrated Solid Waste Management Program,

- Sustainable Building and Construction,

- Cleaner City-Vehicle Emissions,

- Sustainable Manufacturing,

- Sustainable Tourism,

- Sustainable Agriculture

- Education for Sustainable Consumption.

The above pilot projects were selected basing on Relevance to national needs, potential to provide synergy to existing initiatives, relevance to SCP program of the Africa region, potential to deliver quick impacts with multiplier effects, existence of capacity to implement within existing infrastructure, and more importantly being part of the global process supported by donor communities.

The government of Uganda also enacted roadmap for creating an enabling environment for delivering on SDGs in Uganda. The SDGs have also been translated into some of Uganda's most spoken languages to enable everyone understand and participate. The implementation of SDGs in Uganda is coordinated through the National SDG Coordination Framework. The Framework spells out clear mandates for planning, reporting, monitoring, resource mobilization, communication, advocacy and decision-making for implementation of the SDGs anchored within existing national coordination structures. The SDGs are expected to be fully domesticated through sector and local government planning, budgeting and project implementation. The SDGs are also part of the plans by the national sectors, Ministries, Departments and Agencies, and Local Governments.

Other initiatives in corroboration with international organizations and supported by the government of Uganda include;

1. One Planet network initiatives whose projects include;

   - Collaborative forest management,

   - Greening supply chains,

   - Biomass clean cook stoves and fuels.

2. SWITCH Africa green program projects that include;

   - Promotion of Water use efficiency techniques and Practices in Micro, Small, Medium-sized Enterprises,

   - Upscaling Generation, Commercialization and Utilization of Biomass Waste-based Green Energy Sources,

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- Promotion of Energy Efficiency Techniques and Practices in micro, small and medium enterprises (MSMEs),

- Eco-Agriculture among Young Rural People, Promoting Inclusive Green Business Practices in the Tourism Sector

- Promoting sustainable product innovation and energy efficient practices among small scale industries in Uganda.

All the above policy initiatives and projects in support for SCP acts as the best opportunity in bringing on board the public sector and supporting partners to promote LCA initiatives including supporting LCA database roadmap.

Although circular economy is new in Uganda, one study is underway to show the importance of circularity using LCA in one min paper recycling plant. This study is under the African Circular Economy Network, a Network established to promote Circular Economy in Africa.

1.2.3 LCA in research and academia

The first report on the subject of LCA appeared as early as in 2002, while the number of publication has increased since 2008. The majority of the publications are from academic work at universities in collaboration with international researchers. Very few publications are from independent researches. The researches focus on waste management, sanitation, energy, and agriculture products. More details are provided in the references section 5.0.

There was a notable increase in publication over the last 5 years, indicating a growing interest in LCA, mainly from academia and to less extent independent researchers.

In academia, five universities have so far introduced Sustainability and LCA courses in their curriculum. These include Lifecycle Analysis and Sustainability, at Makerere University, sustainable built environments at Uganda Martyrs University, Environment and Sustainability at Mabarara University, sustainable use of natural recourses at Gulu University, and sustainable environmental management at Kyambogo University.

In addition, Kyambogo University and Makerere University, together with the Uganda National Bureau of Standards as the organizer have been instrumental in being part of LCA trainings and LCA pilot projects conducted in Uganda.

1.2.4 Other LCA activities

Uganda has been participating at ISO in the development and reviewing of the LCA standards. This has led to increased appreciation of the importance of LCA and created awareness among different stakeholders through engagements in Technical committees and workshops. This work is led by Uganda National Bureau of Standards, government agency responsible for the formulation, promotion of the use of, and the enforcement of standards in protection of the environment, public health and safety.

2.0 National LCA data

In Uganda, formal national LCA capacity building started in 2013. Due to increased awareness of the importance of environmental protection, and the possible impacts associated with products among different stakeholders, there was increased interest to understand and address these impacts. Uganda National Bureau of Standards (UNBS), a standards agency responsible for the formulation, promotion of the use of, and the enforcement of standards in protection of the environment, public health and safety sought support to implement international standards for life cycle assessment (LCA) (ISO 14040 and ISO 14044). This was to support build capacity of industry, government and the academia in implementation of these standards. In addition, with support from the Swedish Standards Institute (SIS), different capacity building programs on LCA were done with participants drawn from industry, government, Non-Governmental Organizations (NGOs, the academia and independent researchers. During the implementation of these capacity building programs, lack of national LCA data was identify as a major challenge.

2.1 LCA implementation capacity building

With financial support from Sida, thirty five people were trained in the application of LCA standards in the period 2013 to 2017. In partnership with Kyambogo University and Makerere University, twenty five trainees participated in LCA pilot studies on pineapple, hot pepper, coffee, sugar, papaya, and briquettes, with two studies now undergoing critical review before publication.

These pilot studies were under the supervision of Dr. Nydia Suppen from Center for LCA and Sustainable Design, Mexico. From the climax of the studies, six people were trained as LCA trainers under the Training of Trainers (TOT) program (2013-2017).

The LCA trainees further participated in the implementation of the 2014 UNEP funded pilot case study on "Life Cycle Management Capability Maturity Model (LCM-CMM)" for Rural Community in Development, a food processing industry in Uganda.

2.2 Database development capacity building

Seventeen people were trained in LCA database development with the objective of facilitating the establishment of Uganda LCA database. The training covered data acquisition and documentation (including calculation and modeling), data quality review, and strategic continuous improvement in quality and quantity. The participants were from academia, government, NGOs and practitioners. This was achieved with the financial support from Sida. The training "Training trainers and establishing LCA database" was conducted between 26th -29th November 2013, by Raul Carlson (then a senior researcher at Viktoria institute, Gothenburg, Sweden). The goal of the training was**: To Start the path to indipendent trainers in LCA by establishing the basis for the Uganda LCA database.**

The training focused on;

- Introducing the ISO LCA (Life Cycle Assessment) standards ISO 14040, -44 and -48 (and also ISO/TS 14033)
- Establishing a thorough knowledge of how to establish the Uganda LCA database:
    - What the database is
    - Technically, Organizationally, Strategically and Practically
    - How to organize the work

        - Data acquisition and documentation (including calculation and modeling)

        - Data quality review

        - Strategic continuous improvement in quality and quantity

- How to use the two standard ISO/TS 14033 – Quantitative environmental information and ISO/TS 14048 – LCA data documentation as tools for the national LCA database

- Establish the necessary exercises, skills and discussions for independent trainers to acquire the understanding of LCA.

The people trained participated in the LCA pilot studies (2.1) and are very active members of the LCA Network Uganda, and part of the team working on this roadmap project.

2.3 Database development and data collection initiatives

Following the database development training in 2.2, Working groups for developing a strategic data base vision document, acquiring data for hydro power electricity production and biomass energy production, transport and performing impact assessment of full electricity were formed. The visionary and strategic document for the database would show the potentials for building cooperation between industry, government and academia to establish academic work, knowledge build-up, and data acquisition.

This project is therefore timely, as the earlier established plans and working groups will serve as a starting point and contribute greatly to the development of the LCA database roadmap. The project of roadmap development will therefore be successful since both the financial and trained human resource from different sectors are available to contribute greatly.

3.0 Stakeholder mapping

3.1 Stakeholder groups

As part of project activities, LCA Network Uganda held one-on-one meetings, virtual meetings, and group consultations with key stakeholders (Appendix A). This was followed by email and phone call consultations. The objective was to provide the background information to each stakeholder in line with their mandate and priorities, the relevance of LCA to their work, and their potential role in contributing to LCA database development and usage.

To start with, five broad categories of stakeholders were identified –public sector, Industry and private sector, Academia and research, civil society and independent experts. Specific organizations and individuals within the five categories were identified and selected based on their previous interest, participation and support to LCA activities in Uganda (Table1). Other stakeholders were also selected based on their previous support and participation in sustainability projects like policy formulation and startups.

Table 1: Ranking of different stakeholders according to selected engagement parameters.

Stakeholder	Contribution	Willingness to engage	Influence	Necessity of Involvement
The public sector	**High:** Drives policy and regulations. Key in financing	High	High	High
Industry and the private sector	**High:** provides data and are major users	Medium	Medium	High
Academia and research	**Medium**	High	Low	High
Civil society	**Medium**	High	Medium	High
Independent experts	**Medium**	Low	Low	High

3.1.1 The public sector

This is a major stakeholder since it oversees the economic development of the country and without its support, projects support and success is hindered. These also are major in spearheading policy formulation tailored to sustainability and enforcing of regulations. The stakeholders consulted in the public sector include government ministries and government parastatals.

3.1.2 Industry and the private sector

Industry plays an important role in promotion of SCP. The awareness of environmental concerns has led the manufacturing industry to become proactive in the design of new products, improve those which already exist and develop cleaner manufacturing

processes. If adopted, LCA is a major contributor to their sustainable production and consumption, and their supply chain stakeholders. The industrial sector is therefore one of the major stakeholders.

The stakeholders from industry include both from primary, secondary and tertiary sectors of the industry.

3.1.3 Academia and research

The Academia is key in LCA advancement as it develops and disseminates sustainability knowledge/education. This can be done through including LCA in the curricula and actively supporting different researches in LCA/sustainability. Different Universities involved in the sustainability work were consulted.

3.1.4 Civil society and others

Transformation is greatly accelerated by the engagement of civil society which can move entire value chain through advocacy. The civil society is listened to and has weight in society. The civil society consulted include; NGOs, media associations, manufacturers association, consumer association and startup funders.

During the engagement, in addition to discussions on developing LCA database roadmap, participants were also requested to recommend other stakeholders who should be consulted on the issue. All organizations/individuals recommended were contacted by mail or phone. The ones who responded were engaged for further consultations through phone calls and mails.

The list of stakeholders consulted and their responses are presented in Appendix A and B respectively. Overall the stakeholders are positive about the project although many questions remained especially on the financial support.

3.2 Organization of the national LCA community

Formal organization of the Uganda LCA community began in 2013, with training of different stakeholders. The support from The Life Cycle Initiative in 2016, was a climax to the formation of The LCA Network Uganda that is legally incorporated in Uganda. LCA Network Uganda was formed with a mission to promote life cycle thinking in Ugandan.

This is the first and the only known LCA community in Uganda so far. It is composed of members from different sectors such as academia, civil society, NGOs, government and LCA experts. The major interactions are through face to face meetings and emails, with at least one face to face meeting every year.

3.3 International connections and collaborations

Different connections have been established and these include UNEP/ Life Cycle Initiative who supported the formation of the LCA Network in Uganda. Also at regional level, contacts were established and discussions on forming the East African regional LCA Network were held. Informal talks on formation of the East African LCA Network were held in 2016 with a view of national LCA Networks coming together to form the East African LCA Network. However, no much progress has been made since not all countries in the region have established National LCA Networks.

4.0 Conclusion and Recommendations

4.1 Conclusion

Overall, stakeholders' engagement showed support for the need of the LCA database development roadmap and subsequently a database. However, more concern was put on the benefits associated with LCA and the financing of the database and other LCA activities like capacity building. The solutions for financing and other concerns will be discussed further during the roadmapping process. Specifically the conclusions from the baseline assessment and stakeholders mapping include;

- There is commitment from different stakeholders to participate and support the project.
- Five stakeholders accepted to provide time during their workshops and meetings for the project to be highlighted to explain the relevance and benefits, and attract more stakeholders.
- Stakeholders from academia were eager to support the project and possibly convince their universities to host the future database.

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- The NDWG should be composed of experts, influential representatives from different sectors to spearhead the support for the sustainability of the project beyond the roadmap document.

The different stakeholders engaged showed commitment to further participate and provide any other information that would make the project successful.

4.2 Recommendations

- Make government agencies more involved in LCA activities for it to appreciate the advantages associated with LCA, and engage more stakeholders from different sectors as possible.

- NDWG should be composed of stakeholders with knowledge on roadmap development, LCA and sustainability activities and members should be representative across the stakeholders divide.

- Different NDWG members should be actively engaged in playing different roles and engage widely with more stakeholders to capture majority of relevant stakeholders' inputs for a better and sustainable roadmap.

- The NDWG should have an agreed upon proper reporting mechanism and deliverable timelines.

- The IWG representative should continually be in contact with NDWG members to provide guidance according to IWG agreed positions.

- The National coordinator should provide periodic updates and ensure deliverables are timely and the speed of progress is in line with the project timelines.

- The chair of NDWG should actively engage the members and provide periodic reports on the progress and status of the activities in relation to project deliverables and timelines

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Appendix A - List of stakeholders

Sector	Stakeholder	Involvement	Contact established
Public	Ministry for Agriculture, Animal Industry, & Fisheries	Direct	Yes, Mr. Muzira Fred, Senior Inspector
	Ministry for Water & Environment	Direct	Mr. Magara Nicholas, Regional Wetlands Coordinator
	Ministry for Trade , Industry and Cooperatives	Direct	Mr. Prime Blessed, Ag. Senior Industrial Officer
	Uganda industrial research institute	Direct	Mr. Asuman Ratib, Senior Analyst
	National environmental management authority	Direct	Ms. Nereko Patience, Principal Environment Officer
	Uganda National Bureau of Standards	Direct	Ms. Nabaggala Prossy, Senior Standards Officer
	Ministry of Energy and Mineral Development	Direct	Ms. Akum Justine, Energy Officer

	Ministry for Works & Transport	Indirect	No
	Uganda Coffee Development Authority	Direct	Mr. Kiwanuka David, Manager Quality Assurance
	Kampala Capital City Authority	Direct	Mr.Byangire Paul, Physical Planning Engineer
	Ministry of Finance, Planning and Economic Development	Direct	Ms. Kibenge Sarah, Policy Analyst
	Uganda Cleaner Production Center	Direct	Silver Sebaggala Director
Industry/private			
	Uganda manufactures association	Direct	Mr. Ssali Godfrey, Senior Policy Analyst
	Uganda Small Scale Industries Association	Indirect	
	Technical Committee of Environment Practitioners	indirect	

	Private Sector Foundation Uganda	Direct	Ms. Ekanya Eva, Senior Projects Officer
Academia and research			
	Makerere university	Direct	Dr. Mfitumukiza David, Senior Lecturer
	Kyambogo university	Direct	Mr. Wekoye Stephen, Lecturer
	Uganda Martyrs university	Direct	
	Mbarara University of Science and Technology	Direct	Dr. Twongyire Ronald, Senior Lecturer
	Gulu University	Direct	Dr. Opio Alfonso, Senior Lecturer
	Kabale University	Indirect	
	International University of East Africa	Indirect	
	Kampala International University	Direct	Mr. Ssendawula Charles, Lecturer

Civil society			
	Uganda consumers protection associaiation	Indirect	
	National Association of Professional Environmentalists	Indirect	
	Pro-biodiversity conservationists in Uganda	Indirect	
	Uganda Environmental Education Foundation	Indirect	
	Uganda National NGO Forum	Indirect	
	Environmental Alert	Indirect	
	Environmental Management for Livelihood Improvement	Indirect	

Appendix B - Stakeholder engagements

Discussions during the meetings summarized and presented	
Why Questions (Answers to these will feed into 'What')	**Responses**

Do we need Uganda LCA database	1. Most Yes.
	
	    • If it contributes to sustainable development
	
	    • If it contributes to trade and economic development
	
	    • If it contributes to the National Development plan
	
	    • If it is supported by development partners and signed international conventions
	
	2. Necessary but with reservations
	
	    • If the cost of implementation is high compared to the benefits.
	
	    • If possible to have one regional database for sustainability.

Benefits mapped to specific stakeholders	1. Government/authorities-Help in policy formulation and environmental sustainability, and financing
	2. Industry - Help to promote cleaner production and SCP. -May help in reducing on cost of production and promote resource efficiency and better product designs
	3. Academia- Help in research and promote evidence based initiatives and equip the public with proper knowledge through education.
	4. Civil society-Helps to have a basis for evidence based advocacy and decisions.
What strengthens the need for Uganda LCA database	1. Enhance international trade with relevant partners that implement LCA in decision making
	2. Implementation of ISO standards to promote sustainability
	3. International initiatives and advocacy for life cycle thinking
Concerns and potential Inhibitors of database development	1. Not enough technical skills/ database development capabilities

	2. High costs attached to data collection
	3. Government /Political backing and government prioritization
	4. Interests of different stakeholders not being harmonized.
Who Questions (Answers to these will feed into When)	Responses
Who will host the database	1. Different proposals, for Academia and within government institution
	2. Anonymously agreed to be decided in the next stakeholders meetings as everyone thinks more about it.
Stakeholders & their Roles	1. Government- promotion of LCA based decisions and support awareness programs among different sectors
	2. Civil society- incorporate, promote and support LCA initiatives.

	3. Academia-introduce LCA in education and support LCA related research
Capacity development	1. Government and academia should play a leading role 2. Higher institutions should introduce different sustainability courses.
How Questions	Responses
Database format/ Coordination with other international efforts/	1. Should follow international established formats 2. Learn from the previous database development initiatives. 3. Need for more international support and corroboration
Challenges	The financial support is the foreseen biggest challenge.
Priorities in terms of products, materials and processes to be studied	1. Should focus on the hydroelectricity, biomass energy and transport 2. Agro processing industry

Costs/financing	1. Source government funding 2. Source funding from international partners 3. Source fudding from civil society