Centre for Rural Development (SLE)

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Sustainability Hot Spot Analysis - Uganda

Flavia Marà

Abstract

In the context of sustainability assessment of food value chains (VC), several methods and tools have been developed. These are frequently considered to lack a holistic approach and stakeholder involvement, and/or their application is deemed to be too complex and top-down. This paper focuses on the design and implementation of the Sustainability Hot Spot Analysis (SHSA) 2.0, an adapted version of the SHSA developed by the Wuppertal Institute, which is used to identify priority areas for interventions along VCs. After outlining the main features of SHSA 2.0 and its methodological approach, this brief summarises the experiences of the design and empirical application of the method in the case studies of the Irish potato and Nile perch VCs in Uganda promoted under the ONEWORLD No Hunger initiative of the Federal Ministry for Economic Cooperation and Development (BMZ). It concludes that the SHSA 2.0 offers a practical, holistic, and participatory tool for assessing food VCs, enabling the integration of scientific and local knowledge in a participatory fashion, and allows for co-ownership of the research and co-creation of knowledge between VC stakeholders and researchers.

Introduction

Existing approaches to define and assess sustainability in the context of food value chains (VC) development are often considered complex and time-consuming, frequently limit stakeholder participation, and are mostly implemented top-down (Mauser et al., 2013). In an attempt to overcome the conceptual and practical challenges related to sustainability assessment along value chains, the Wuppertal institute proposed a Sustainability Hot Spot Analysis (SHSA) (Bienge et al., 2009). In this respect, the SLE overseas Project in Uganda, as part of the Sustainability of Modern Agri-Food Systems (NAMAGE) research project at SLE, developed a holistic, participatory, and feasible method to assess the sustainability of food VCs: the Sustainability Hot Spot Analysis (SHSA) 2.0. This is an adapted version of the SHSA developed by the Wuppertal Institute (Bienge et al., 2009; Rohn et al., 2014).

The SHSA 2.0 was used by the SLE research team in

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The Centre for Rural Development (SLE) is affiliated with the Albrecht Daniel Thaer-Institute for Agricultural and Horticultural Sciences in the Faculty of Life Sciences at the Humboldt-Universität zu Berlin. Its work concentrates on four branches: international cooperation for sustainable development as a post-master degree course, training courses for international leaders and experts in the field of international cooperation, research on sustainability issues, and advisory services for universities and organisations.

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the Irish potato and Nile perch VCs in Uganda. This method helped to identify sustainability hot spots (SHS) along the two VCs and to point out potential solutions. The project areas of the targeted VCs were in two different locations: the Mt Elgon region for the potato VC and the Nile perch VC on the shores of Lake Victoria. The research team in Uganda, hereinafter referred to as "we", was an international and interdisciplinary team composed of SLE members and Ugandan professionals, whose variety of expertise along with knowledge of local contexts and customs contributed significantly throughout the research process and to the successful use of SHSA 2.0.

This brief paper thus focuses on the design and implementation of SHSA 2.0. The aim is to share practical insights into the methodological experience of the SLE project in Uganda using SHSA 2.0. After briefly describing the method and the suggestions implemented by the team, we present the overall methodological approach and provide details related to the application of SHSA 2.0 in the empirical context, including methods for data collection and analysis. In the final sections, we draw attention to the lessons learned from the use of this assessment method and provide conclusions.

Description of the Sustainability Hot Spots Analysis (SHSA) 2.0

The Hot Spot Analysis (HSA) is a method originally developed by the Wuppertal Institute for Climate, Environment and Energy (Bienge et al., 2009). Compared to most technical life cycle assessment methods that require high levels of expertise, resources, and data, the HSA aims to provide a quick, simple, and cost-effective alternative to highlight the most pressing issues within a product VC through stakeholder involvement (Rohn et al., 2014). Initially looking only at resource intensity across VC stages (Wallbaum & Kummer, 2006), the HSA has since been broadened to social aspects and is now often labelled Sustainability Hot Spot Analysis (SHSA) (Bienge et al., 2009). In a qualitative estimation of the social and ecological impacts of a product's life cycle, it is geared towards informing decision-making processes by identifying key priority areas for action, so called "hot spots" (Liedtke et al., 2010).

In its existing versions, the SHSA is conducted in five steps (Bienge et al., 2009; Rohn et al., 2014):

Step 1: The VC stages (life cycle phases) and the categories to be assessed are defined. Depending on the product, these stages might include raw material extraction, production, aggregation, processing, distribution, consumption, and waste, but are usually limited to four or five phases. Categories are instead determined according to project objectives.

Step 2: The relevance of these categories in each VC stage is assigned as inapplicable (score 0), low (score 1), medium (score 2), or high (score 3).

Step 3: The impact of the phases are determined against each other on the same scale.

Step 4: The scores of steps 2 and 3 are multiplied to identify sustainability hot spots, which now have a minimum score of 6 (3x2) or a maximum score of 9 (3x3).

Step 5: Stakeholders and experts review and validate the results. Apart from the stakeholder review and evaluation to ensure the robustness of the results, all steps are mainly based on a literature review and occasional individual expert interviews.

Limitations of the SHSA by Wuppertal Institute

We observed that the existing SHSA is limited in its categories, as it does not include economic, political, or cultural aspects thus not covering critical sustainability dimensions. In addition, researchers and practitioners using the method rarely collect primary data, but mainly rely on literature reviews and only include VC stakeholders in the validation process, if at all (Bienge et al., 2009; Lam, 2013; Liedtke et al., 2010; Rohn et al., 2014). This further limits the empirical evidence of the SHSA approach.

Relevance and impact assessments are often aggregated and amalgamated to entire VC stages, clusters of categories, or even dimensions, leading to generic and inaccurate assessments, e.g., when entire VC stages receive a single relevance score, (Rohn et al., 2014).

Moreover, a sustainability assessment through SHSA is not, per se, participatory. Sustainability assessments based on expert-led and top-down approaches, on the one hand, push for quantifiable indicators that allow for regional comparisons. On the other hand, they present potential shortcomings, such as the alienation of local communities and the failure to capture views from diverse stakeholders (Fraser at el., 2006). Community engagement in sustainability assessment procedures assures the selected indicators are relevant and context specific and evolve over time with the community. Participation leads to empowerment and the built capacity of communities to address emerging challenges in their local environment (ibid.). To facilitate participation and include evidence-based assessments informed by both primary and secondary data, we proposed the Sustainability Hot Spot Analysis 2.0 (SHSA 2.0).

Suggestion for overcoming limitations: SHSA 2.0

SHSA 2.0 aims to cover economic, political, and cultural categories, in addition to social and environmental ones. Hence, we expanded the original SHSA by involving stakeholders in every step of the SHSA 2.0 and by including agroecological principles developed by HLPE (2019) and elements elaborated by FAO (2018), as well as elements of VC promotion to outline categories and indicators. These are adapted to the local context using participatory methods such as focus group discussions (FGD) and photovoice, but also key-informant interviews (KII) during the exploratory phase (see Methodological Approach) to capture the views and priorities of the different VC actors.

Therefore, SHSA 2.0 integrates participatory elements throughout its stepwise approach. In practice, stakeholders can provide feedback on the proposed categories and remove and/or add new ones. Afterwards, they individually score the relevance of the determined categories at each step of the VC. The selection of indicators to assess the impacts of categories can also be agreed upon by stakeholders. Then, we included a phase of empirical data collection to assess categories and indicators. Finally, once the SHS are identified, stakeholders validate and give feedback on the results and suggest recommendations and potential solutions for addressing these hot spots.

Per each VC assessment of this research project, SHSA 2.0 looked at more than 20 categories grouped into the three sustainability dimensions: environmental, social, and economic. Political and cultural categories are integrated in the social dimension. Five VC stages were identified in this study: production, aggregation, processing, distribution, and consumption.

Methodological approach

In this SLE overseas project in Uganda, we used a mixed-method approach including qualitative, quantitative, and participatory research methods and followed a stepwise research design for the application of the SHSA 2.0, as illustrated in Figure 1.

This approach was adopted for both Irish potato and Nile perch VCs, with only minor differences in the use of methods for the empirical assessment of indicators (see Indicator assessment and impact scoring). Within this framework, an exploratory phase (step 1) served to better understand the two VCs and to adapt the predefined VC stages and categories to the local context. We then designed and conducted workshops with VC actors and other stakeholders to score the relevance of proposed agroecological categories and to identify and select relevant indicators (step 2 and step 3). Following this selection, indicators were assessed based on primary data, i.e., quantitative surveys with potato farmers, FGDs with fisherfolks and semi-structured interviews with other VC actors, as well as secondary data, i.e., literature reviews. Using this evidence-based indicator assessment, we evaluated the impact scores (step 4).

Relevance and impact scores were multiplied to obtain the final SHSA scores and to identify the SHS along the VCs. Figure 2 presents an example of SHSA 2.0 matrix with the derivation of relevance, impact, and SHSA scores. Here relevance and impacts are not aggregated but assessed for each in-

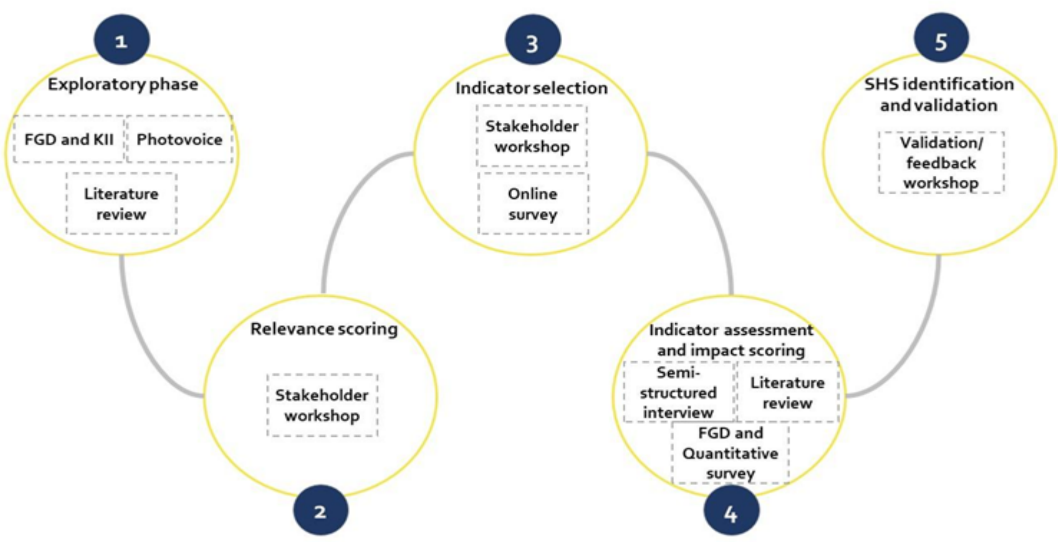

Figure 1: Methodological approach step-by-step (Source: own illustration)

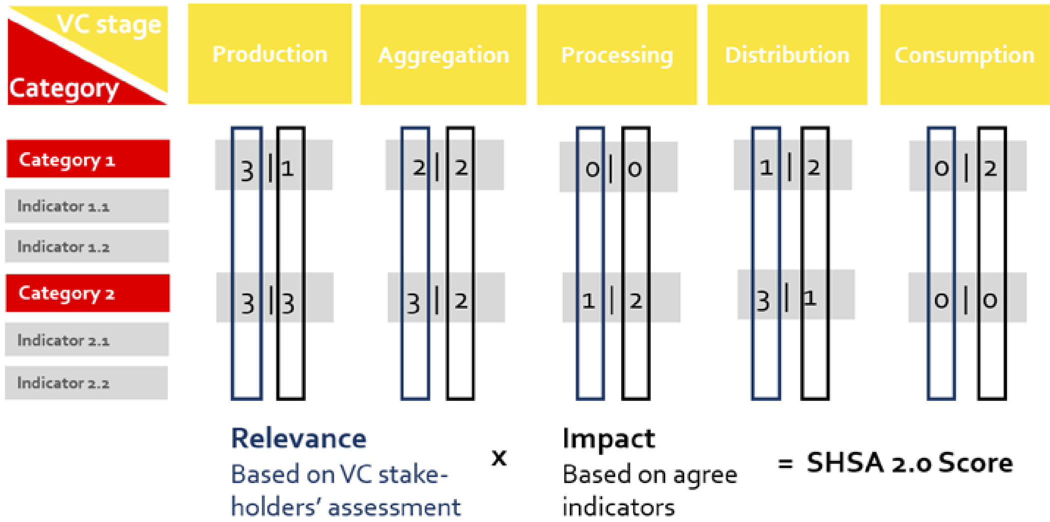

Figure 2: Example of SHSA 2.0 matrix and derivation of scores (Source: own illustration)

dividual category in each VC stage. In conclusion, (step 5 in Figure 1), VC actors and stakeholders were able to provide feedback and validate the identified SHS in a validation workshop.

Design and implementation of data collection and analysis

For the purpose of this brief paper, we primarily focus on the methods conducted during the SHSA 2.0, which starts with step 2 in Figure 1. These are further described in the following subchapters.

However, it is worth mentioning that an initial exploratory phase was significant for the research team to develop a joint understanding of the studied VCs and their challenges. Also, a refinement of the categories and indicators identified during our preparation period in Berlin was made based on new data acquired during the exploratory phase. This phase was conducted by the entire team working together on Irish potato and Nile perch VCs. Subsequently, the research team split into two smaller groups, one for each VC, with the team leader supervising both groups. Therefore, the steps and methods presented below were carried out by the 'potato' and 'fish' teams.

Relevance scoring and indicator selection

Stakeholder workshops

To assess the relevance of categories in the potato VC, four stakeholder workshops were held. One workshop was conducted with 13 members of two multi-stakeholder platforms active in the Ugandan potato sector; it took place in Kampala. The other three workshops were conducted with potato farmers in the three project districts in the Mt Elgon region, with a total of 19 participants. Key informants from the two multi-stakeholder platforms assisted the potato team in identifying respondents, members, and non-members of the platforms who participated in the workshops, based on the snowball approach.

For the Nile perch VC, a stakeholder workshop was held in Jinja with the participation of a wide range of VC actors and stakeholders. Likewise, the fish team followed a snowball approach, using key informants to identify local respondents in particular distributors and processors, as well as the advice of a fisheries inspector or fisheries officer from the respective landing sites to select maw traders, fishers, factory agents.

After an introduction to the method, the stakeholders were guided through the categories grouped into environmental, social, and economic dimensions. Once a common understanding of each category was attained, stakeholders were invited to individually evaluate, in a provided table, the relevance of the categories within each of the five VC stages by giving a score: 0=n.a./do not know, 1=low relevance, 2=medium relevance, 3=high relevance. Stakeholders could then add and agree on new categories that were thought to be overlooked in the list suggested by the SLE research team.

Subsequently, we aggregated all relevance scores by category and calculated the mean. It is important to mention that this aggregation was done separately between the two VCs. After that, only categories with at least a mean value of 2 (medium relevance) were considered for further analysis as categories with lower scores are not considered sustainability hot spots (Rohn et al., 2014).

The selection of indicators for the fish VC was performed during the second part of the workshop with the same stakeholders. The participants were divided into three groups and were assigned one of the three dimensions of sustainability (en-

Figure 3: Workshop with Nile perch value chain stakeholders (left) and Irish potato farmers (right) (Source: Hendrik Hänke and Jasmin Ahmed)

vironmental, social, and economic) according to their expertise, while also considering the different perspectives within each group. Each group discussed the indicators that we proposed, deleted some, suggested others, and made priorities for the agreed upon indicators for each category. As a result of this activity, 67 indicators were selected across the production, aggregation, processing, distribution, and consumption stages.

Online surveys

For the potato VC, the selection of indicators took place at a later stage, and the format of the activity was an online survey. After the stakeholder workshops, we identified and proposed a list of 120 indicators for the selected categories. The online survey was sent to the 13 members of two multi-stakeholder platforms that participated in the first workshop and to other VC actors as well as non-platform members from the three project districts. We asked the participants to rank these indicators in descending order according to their importance in potato VC. A total of 24 respondents completed the online survey. As a result of this activity, 38 indicators (two indicators per category) were chosen across the five VC stages.

The selected indicators in both VCs were subsequently assessed, and data were collected through quantitative and qualitative methods as well as literature review, as presented in the following sections.

Indicator assessment and impact scoring

The methods outlined as following were used to assess indicators through evidence-based procedure and define the impact scoring. Finally, through the multiplication of relevance (see Relevance scoring and indicator selection) and the impact scores, the SHSs were identified.

Semi-structured interviews

Semi-structured interviews were used to provide accurate insight into the knowledge and perspective of VC actors (see e.g., Silverman, 2006). In total, we conducted 15 semi-structured qualitative interviews with potato VC actors, except farmers, and 31 with Nile perch VC actors. These interviews were slightly adapted to VC stages and the actors' knowledge. The purpose of these semi-structured interviews was to empirically assess the selected indicators for the aggregation, processing, distribution, and consumption stages.

All interviews were recorded, transcribed, translated into English if necessary, and coded using MAXQDA software.

Focus group discussions

To address the different perspectives within the fisherfolk, the qualitative method that was considered most appropriate for the research was the FGD. As such, we chose to use this technique for indicator assessment in the Nile perch VC and we were able to conduct five FGDs. Five to eight people participated in each FGD, with each participant joining in an additional short individual survey (see below). Four FGDs were conducted with fishers as main actors of the production stage. In addition, one FGD was conducted exclusively with women engaged in artisanal processing. Questions in all FGDs included environmental, social, and economic issues with a focus on agency, fairness, participation, economic benefits, and resilience.

Quantitative surveys

A quantitative survey is used to capture the behaviours, trends and perspectives of the targeted group by analysing a sample of them (see e.g., Creswell, 2014). Therefore, we decided to utilize it at the production level in the potato VC, where most stakeholders are located. In total, quantitative surveys were conducted among 138 potato farmers. The surveys included questions addressing household composition, potato production, sales and challenges, farming practices, agroecological practices, livelihoods, farming economics, income, access to extension services, and others. The surveys were done on tablets equipped with the KoBoToolbox software. The objective of the survey was to empirically assess potato production-related indicators.

Of the fisherfolk in the Nile perch VC who participated in FGDs (n= 36), a complementary quantitative survey was done on tablets with the same software. Questions addressed access to resources (boats, fishing gear, fuel), economic resilience (through insurances, contracts, financial services), income, as well as fish consumption habits.

The KoBoToolbox toolkit was also used to manage and analyse the data collected. The data were in fact downloaded in Excel format for cleaning and analysis purposes.

Validation/feedback workshops

At the end of the research phase in Uganda, we organized separate validation/feedback workshops for Irish potato and Nile perch VC stakeholders. The workshops took place in Mbale (for potato), in the Mt Elgon Region, and in the capital Kampala (for Nile perch). 20 stakeholders participated in the potato workshop. 17 stakeholders attended the Nile perch VC workshop. The participants were partly the same as in the first stakeholder workshop, allowing the participants to link validation with previous category and indicator selection and relevance scoring.

The objective of the workshops was to present and discuss findings on the main SHSs identified along the two VCs in Uganda and discuss potential recommendations.

Conclusion: lessons learned and recommendations

We conclude that SHSA 2.0 offers a practical and holistic tool for evaluating SHS, particularly as an ex-ante VC assessment. It provides a wide and rapid understanding of the VC sustainability challenges faced and it can inform decision-making processes by identifying priority areas for action within VCs. SHSA 2.0 is also well-suited for problem assessments, feasibility studies, VC development projects, and when data and/or knowledge on target commodities is scarce. Its high degree of transparency and the participatory nature of steps involved makes the collected data an ideal baseline for measuring progress of project interventions over a given period.

Based on this experience, we find it crucial that the SHSA categories need to be adapted to the local context and that their terminology needs to be made understandable to the diverse group of stakeholders. Indeed, we observed that often, complex agroecological terminologies (FAO, 2018; HLPE, 2019) were difficult to understand by academic and non-academic participants and failed to match local realities. On the other hand, the use of agroecological principles helped to establish a comprehensive framework to address sustainability challenges in food VCs and food system transformation. Moreover, working with a set of predefined categories within an established framework has the significant advantage of speeding up the research process and allowing comparison of results with other studies across space, time, and VCs, when drawn from the same framework.

Certainly, access to stakeholders and their mobilization is crucial for a successful SHSA 2.0. Adequate representation and participation of stakeholders from all VC stages ensures a balanced assessment of SHS. Nevertheless, it is important to stress that applying this criterion on the ground can be challenging, as some stakeholders are more difficult to access than others or may show limited willingness to disclose information.

The SHSA 2.0 method has proven to be effective in integrating scientific and local knowledge in a participatory fashion. Participation can be time consuming and biassed, and therefore inaccurate results might be obtained when time is limited. To tackle the limitation of participatory instruments, per se, we conclude that they need to be carefully designed and implemented. To this end, collaboration with colleagues on the field who have knowledge and understand the local context is key in supporting participatory research processes.

The mixed-method approach including qualitative, quantitative, and participatory research methods, which was deliberately developed in the SHSA 2.0, helped to identify locally relevant aspects along the VC and to capture different views and priorities of stakeholders for VC sustainability. Furthermore, by integrating the empirical research phase for the evidence-based assessment of indicators, it was possible to draw attention to different behaviours, trends and perspectives which characterise each stakeholder group and ultimately impact the sustainability of the VC. The high stakeholder participation within the SHSA 2.0 allows for co-ownership of the study and co-creation of knowledge between VC stakeholders and researchers, resulting in a higher probability of positive real-world impacts compared to, for example, top-down approaches.

Finally, as SHSA 2.0 tries to strike a balance between being neither too limited nor too costly, we recommend conducting a priori cost–benefit check of the application of this method considering the quantity and quality of up-to-date literature available on the topic of investigation.

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Centre for Rural Development (SLE)
Hessische St. 1-2 & Robert-Koch-Platz 4
10115 Berlin
Telephone: +49 (0)30 2093-46890
Fax: +49 (0)30 2093-46891
Email: sle.agrar@hu-berlin.de