Global Assessment of Biomass and Bioproduct Impacts on Socio-economics and Sustainability

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Recommendations on using audit procedures and tools for achieving sustainability within biomass certification schemes

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Content

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Abbreviations

BEFSCI	Bioenergy and Food Security Criteria and Indicators
CABI	Centre for Agricultural Bioscience International
COSA	Committee on Sustainability Assessment
ESMP	Environmental and Social Management Plan
FAO	Food and Agriculture Organization of the UN
FAST	Finance Alliance for Sustainable Trade
GBEP	Global Bioenergy Partnership
IDB	Inter-American Development Bank
IISD	International Institute for Sustainable Development
RSB	Roundtable on Sustainable Biofuels
SCAN	Sustainable Commodity Assistance Network
SCI	Sustainable Commodity Initiative
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme

Preface

The EU funded Global-Bio-Pact project main objective is to develop and harmonise global sustainability certification systems for biomass production, conversion systems and trade.

Towards this aim, this project introduces how the audit process can be developed to become a part of the wider impact assessment programme within the framework of certification schemes. The recommendations will also propose appropriate tools that could be used by local governments, donors, and project managers to ensure that sustainability is being achieved.

This information can then be applied and adapted to the requirements of audits in the framework of the new European Renewable Energies Directive. This will facilitate the implementation of socio-economic criteria in the European Renewable Energy Policy.

1 Introduction

The Global-Bio-Pact project aims at demonstrating the importance of integrating socio-economic impacts in any consideration related to sustainability of biomass, bioenergy and biofuels.

This report (1) shows how the audit process can be used to support impact assessment programmes within sustainability schemes and (2) presents practical tools that can be used to identify, measure, and mitigate potential socio-economic impacts. This information can then be applied and adapted to the requirements of audits in the framework of the new European Renewable Energies Directive.

The objectives of this report are therefore firstly to both to introduce the concept of how the audit process can be used by sustainability schemes as a key input of information to support their impact assessment programme and ways in which this can begin to be implemented; and secondly to provide operators, decision-makers and other stakeholders involved in activities related to the production of biomass, bioenergy and biofuels with practical tools they can implement to better identify, measure, and mitigate potential socio-economic impacts.

The role of sustainability standards has now become firmly established at an international level – the recognition by the European Commission that several schemes have compliance with the Renewable Energy Directive such as International Sustainability and Carbon Certification (ISCC), Roundtable on Responsible Soy Association (RTRS), Bonsucro and Greenergy is an example of progress in this area. However with this recognition there has come increasing demand and realisation, both from civil society and the schemes themselves, that this needs to be supported by action from the sustainability schemes to demonstrate that the positive social, economic and environmental ambitions of the scheme are being delivered.

While the demonstration of social and environmental benefits are key to maintaining the credibility of a certification schemes and their purpose, the issue of how these benefits can be monitored, reported and evaluated in a way that is consistent, accurate and efficient is critical.

Sustainability schemes and best practice organisations such as ISEAL are increasingly looking for effective methods to improve the monitoring and evaluation processes. This can be complicated, with data collection often being time-consuming and costly, and different types of date (i.e. qualitative and quantitative) requiring different approaches. However, one potential method of data collection that has until now been overlooked by many certification schemes is the audit process itself. The audit process presents considerable opportunity in this area, being a compulsory part of most standards with an existing process that could be adapted at a relatively minor scale to effectively report impact information data that can be used by the scheme as well as the operation level.

This first section of the report therefore seeks to give a brief introduction to current proposals on how the audit process can be adapted to include information on impacts, including both at the level of production and certification.

The recommendations that are included in the second section of the report are based on some existing tools, as implemented in standards, certification systems and policies. These tools are primarily designed for use by individual operators at the project level to evaluate socio-economic impacts of biomass, bioenergy and biofuel operations, hence not adapted to measuring macro-economic impacts such as the global effect of biofuel production on food prices.

This report does not intend to be comprehensive with regards to all the existing tools at hand, but presents several examples of practical options for evaluation of socio-economic impacts and implementation of mitigation measures, which could become more widely implemented in policies and standards.

2 Impact Assessments

An impact assessment is a powerful and widespread tool to assess and evaluate the potential impacts – negative and positive – a project could have on the environment or society. The IAIA defines an impact assessment as "a structured a [sic] process for considering the implications, for people and their environment, of proposed actions while there is still an opportunity to modify (or even, if appropriate, abandon) the proposals. It is applied at all levels of decision-making, from policies to specific projects."[1] Impact assessments are widely implemented in countries' legislation and applicable to all sectors, such as construction, agriculture or industry. They are logically useful to evaluate impacts of biomass, bioenergy and biofuel operations as well. There are several types of impact assessments, which cover a wide range of issues; environmental or social impact assessments, for example, are very common.

The *International Association for Impact Assessment* formulates four aims of impact assessments[2]:

- Providing information for decision-making that analyses the consequences of a proposed action or project;
- Promotion of transparency and participation of the public in decision-making;
- Identification of procedures and methods for monitoring and mitigation of adverse consequences in policy, planning and project cycles; and
- Contribution to an environmentally sound and sustainable development.

Impact assessments are primarily beneficial to project leaders and decision-makers, as well as stakeholders and local communities. By assessing and addressing socio-economic impacts of operations, project managers will benefit from improved management systems and practices, decreased likelihood of dispute with local communities or stakeholders, risk mitigation, or an enhanced reputation. Avoided judiciary processes over tenure dispute or penalties for environmental damages represent important cost reduction over the long term.

In the field of biofuels and bioenergy, conducting an impact assessment can prove extremely relevant in the early stage of a project, especially if land acquisition and conversion are necessary. Through an impact assessment, the most likely impacts of the biofuel project can be sufficiently understood, mitigated upfront and monitored over the further development. This ensures that the project can be based on a sustainable structure and therefore, increases the likelihood that it will achieve sustainability and an overall positive impact.

Certification schemes for biomass or biofuels may require impact assessment processes to increase the robustness of their system. Impact assessments can serve as a supportive tool for economic operators towards compliance with standard requirements and therefore sustainable practices. Whether or not an impact assessment is required *per se* for certification, the data collected by an operator during an impact assessment process provides an important understanding of the local context, implemented practices and possible impacts. An auditor can use this data during the certification process to evaluate the compliance of the operation. Logically, conducting a proper impact assessment will also save time and costs for an operator in anticipation of a certification process.

2.1 Measuring impacts of sustainability schemes

Within the context of this report, impacts are here defined as long-term changes in the social, environmental or economic situation that a standards system seeks to address. They are the

[1] Definition by International Association for Impact Assessment: http://www.iaia.org/iaiawiki/impactassessment.ashx
[2] See wiki-webpage of International Association for Impact Assessment: http://www.iaia.org/iaiawiki/impactassessment.ashx

positive and negative long-term effects resulting from the implementation of a standards system, either directly or indirectly, intended or unintended[3]. As described above, the use of impact indicators by sustainability schemes has until now been largely within the context of measuring and monitoring the impact of the operation itself, rather than the impact from implementation of a sustainability standard. Impact indicators commonly used include those related to environmental and social impact assessments, and ongoing monitoring by the operation of their impacts. However, sustainability schemes are now increasingly looking at how this information can also be adapted and used by the scheme itself.

While the distinction between compliance and impact indicators may not always be helpful, ISEAL make a clarification that emphasizes why compliance and impact should be distinguished within the context of monitoring and evaluation[4]. Monitoring and evaluation should focus not on compliance itself, but on the effects of compliance; this will use performance indicators rather than compliance indicators. Evaluation of these results can help to answer the question of whether implementation of the standard is achieving the certification scheme's sustainability objectives.

As a respected body of codes of best practice for sustainability schemes, and with many schemes already ISEAL members[5], ISEAL's codes of best practice can be taken as an indication of how schemes will need to develop their impact assessment programmes. In 2010 the ISEAL Alliance published a Code of Good Practice for assessing the impacts of social and environmental standards systems[6] Intended to guide the development of monitoring and evaluation programmes by voluntary standards systems, all existing ISEAL members will now be required to comply with the ISEAL Impacts Code by December 2013, with new members having 2 years to reach compliance. The Impacts Code requires the development of a theory of change, the implementation of an on-going indicator monitoring system, periodic outcomes and evaluations, and the use of this information for learning and improvement.

To support their members in developing their impact assessment programmes, ISEAL is currently exploring the issue of how to use the audit process for monitoring and evaluation, although this is a relatively new area of work and still in the exploration and research phase. See below for a description of some of the work that ISEAL is doing in this area (*Box 1*).

[3] Definition given by ISEAL (adapted from the OECD glossary) in the ISEAL Code of Good Practice for Assessing the Impacts of Social and Environmental Standards Systems v1.0, 2010

[4] ISEAL presentation, Kristin Komives: 'Making more of existing data collection: M&E and audits', 31st May 2012

[5] Full members include FSC, the Sustainable Agriculture Network, Fairtrade International, the Union for Ethical Biotrade, UTZ, and the Roundtable for Sustainable Biofuels.

[6] Assessing the Impacts of Social and Environmental Standards Systems v1.0, ISEAL Code of Good Practice, November 2010.

***Box 1*. ISEAL: Improving and Demonstrating Poverty Impacts project**

As a part of their work in supporting members implement the Impacts Code, ISEAL is working on a project looking at improving and demonstrating poverty impacts. As part of the research agenda on the impacts of sustainability standards on poverty reduction, ISEAL is looking to develop core indicators that would allow members to collect data through their monitoring systems.

For the first stage of this work, ISEAL is working with the FSC for research on what extent audit data can serve monitoring and evaluation data and how to build baselines. It is hoped that the outcomes of this research will also be able to help establish dialogue on this issue between certification schemes and certification bodies.

ISEAL will also be conducting specific research on how Corrective Action Requests (CARs) can be used for monitoring and evaluation purposes.

(*Source: direct communications with ISEAL)*

3 Role of the auditor in data collection

The audit is a systematic, documented process for obtaining records, statements of fact or other relevant information and obsessing them objectively to determine the extent to which specified requirements are fulfilled[7]. In the case of sustainability standards, these requirements are usually in the form of principles, criteria and indicators[8]. The usual procedure of a certification scheme is that as part of the certification process, the auditor will submit a final report to the standard scheme, which is also provided to the operation itself. This nature of sustainability standards and their audit system therefore presents significant opportunity for adaptation to also include impact data within the existing reporting process. What here needs to be clarified by the scheme to support their wider impact assessment programme is the type of impact information that the auditor is required to report, and what the source of this information should be.

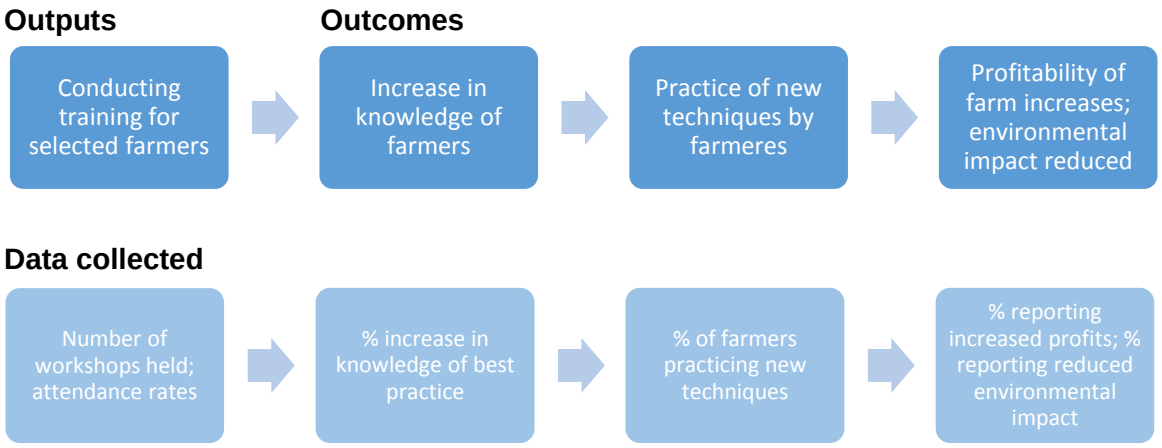
3.1 Impact information

For impact information to be useful to both the standards system and the operation unit, this will need to be considered at two overlapping levels - both information on the direct impacts of production and management from the site being audited (outputs), and the impacts that compliance with certification requirements is having on the production and operations of the site (outcomes). Diagram 1 below illustrates this distinction, with the outputs here showing an example of a direct impact from the site (training for farmers), and the outcomes showing how the effect of compliance is demonstrating the impact of certification requirements (increased profits and reduced environmental impact).

[7] Definition given by ISEAL (adapted from ISO 17000) in the ISEAL Code of Good Practice for Assessing the Impacts of Social and Environmental Standards Systems v1.0, 2010

[8] For more description on this, see Rocio A Diaz-Chavez and Nils Rettenmaier, 'Global-Bio-Pact set of selected socio-economic sustainability criteria and indicators', October 2012.

Diagram 1: Example of measuring impact – from outputs to outcomes[9]



The identification of the different levels of information that may be required to measure an impact (see the example in Diagram 1) emphasises that the audit process will be just one method of data collection at a particular stage of the impact assessment process developed by a sustainability scheme. As described in the sections below, the type of information that can be most suitably and efficiently collected by the auditor for most existing systems is likely to be baseline quantitative data, at the level of reporting outputs or the results of existing outcome reports. For example, while the auditor may report on the percentage of farmers practicing new techniques, this will be from independent evaluation reports provided by the operation rather than from an assessment by the auditor.

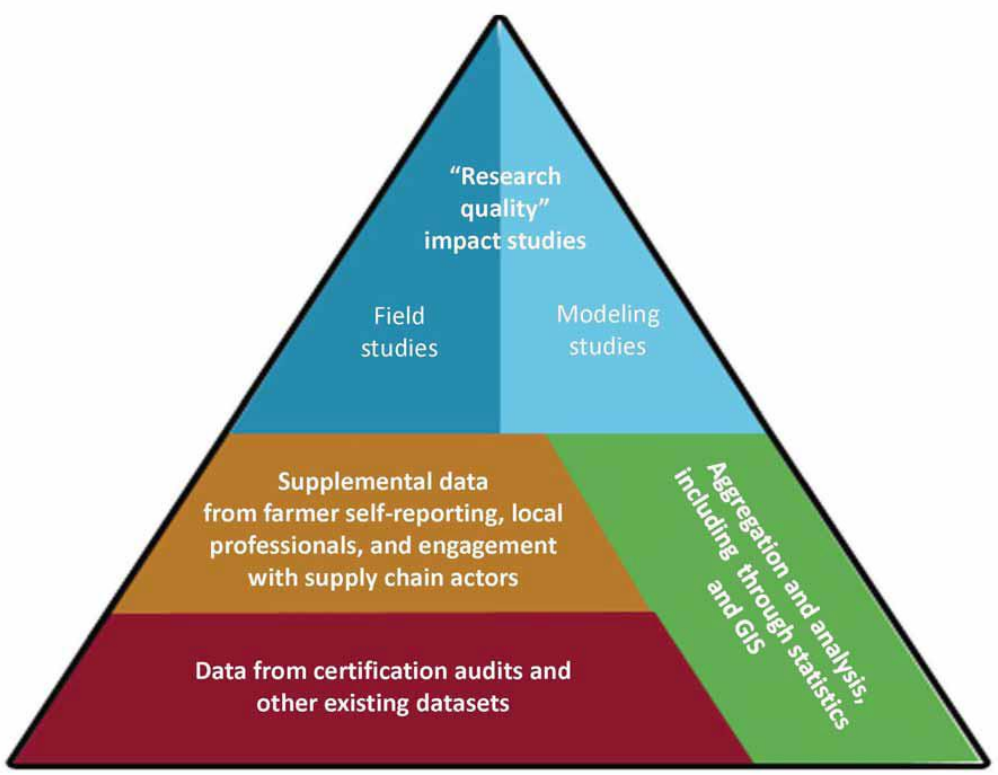
As described in a report by EcoAgriculture Partners on assessing the ecological impacts of agricultural eco-certification and standards: "The practice of ecological impact assessment for agricultural eco-standards should combine a variety of approaches, data types, and methodologies to strike an optimal balance between relevance for multi-stakeholders, cost effectiveness, and rigor"[10]. In the 'pyramid' structure proposed by EcoAgriculture[11], data collection from certification audits sits at the bottom of the pyramid, and is more likely to be used for a more basic level of impact measurement, informed by data that is already being collected (such as farm-level verification data). Above this at the second level would sit supplemental data from farmer self-reporting, local professionals (including auditors), and engagement with supply chain actors – this data would be outside of the scope of routine certification audits but could be obtained with moderate effort and cost. At the top of the pyramid would be 'research quality' impact studies, which would involve trained scientists and professionals, and may involve validation of some of the lower-level data but at greater depth.

[9] Adapted from ISEAL presentation, Kristin Komives: 'Making more of existing data collection: M&E and audits', 31st May 2012

[10] Milder, J.C, Gross, L.H, and Class, A.M 2012. Assessing the ecological impacts of agricultural eco-certification and standards: A global review of the science and practice. Internal report. Washington, DC, EcoAgriculture Partners; 31.

[11] Ibid; 34.

Diagram 2: Pyramid of impact assessment approaches[12]



This model appears to be supported by the ISEAL Assurance code, which states: "Certain types of data (e.g. wages of workers) are readily collectable by the certification auditor, while other information can be collected by other means such as special surveys…A mix of methods is a good way to cross-check data…a standards system could collect data on specific indicators through the audit process and then develop surveys to help corroborate that data"[13].

The most effective source of information collected by the auditor to be used for monitoring and evaluation will therefore be from the information and documents that are already being provided to them during the standard audit process – a combination of self-reported information from the operation and the observations of the auditor. Additional requirements or clarifications may here need to be made by the certification scheme to the operation to ensure that they are collecting, monitoring and presenting this data in a way that the auditor will be able to usefully report (see section 4.2 below).

[12] Ibid; 34.
[13] ISEAL Impacts Code, 9.5 Data Collection Methods

4 Introducing impact information collection into the audit process

There will be many challenges to the scheme in how to effectively implement their impact assessment programme to incorporate information from audits, with this potentially involving changes both to the audit procedure as well as the standard itself.

4.1 Changes to the audit procedure

There is significant potential to how the existing audit process of many certification schemes could be adapted in relatively minor ways to enable collection of useful impact information by the auditor. This could involve no changes to the standard itself, but instead to the audit procedures and documents – in particularly the reporting requirements.

4.1.1 Adapting methods of reporting

A starting point for many schemes can be the adapting how auditors will report information. This could involve the auditor reporting a more detailed level of information on existing requirements, where this extra level of detail could provide useful insight into impact and progress. For example, where an auditor currently reports back that the requirement for a management system to be in place has been implemented, they could now report back on what types of management systems are in place; instead of reporting back that training has been carried out, they could report back on how many members of staff have been trained and what their positions are within the company. This additional level of detail should in most cases be present for the auditor in the information that is already easily available to them within their existing auditing process – the change here would only be in the inclusion of this extra level of specification for certain indicators within the report. For some certain types of impact information this would need to be supported by clearer requirements made to the operation of these expectations (see section 4.2 below).

There may be key types of information that the standard indirectly requires to be collected by the auditor that would be useful for assessing impacts, but that are not currently being consistently collected and reported. The standard could here make clearer these requirements to the auditors, including through training and specific guidance on this area. What could here be critical is the development of standardised formats and templates for recording impact data by the scheme, either as part of or in addition to the standard audit report (see Annex 1).

4.2 Adapting the standard

Complimentary to adapting the audit process, changes to the standard itself could also be effective in establishing audits for the scheme that will result in the reporting of impact data.

4.2.1 Performance and metric based indicators

This will require a move towards introducing new indicators to the standard that are metric-based and performance-based, or modifying existing indicators to be more specific in information that is required from the operation. This may not be suitable for all certification schemes, and for existing schemes introducing changes towards this type of standard may present many challenges and will need to be done over time according to what would be most effective and realistic. However, as with adapting the audit process, changes to certain indicators may be possible with only minimal impact on the operation itself, and using existing procedures that would already be in place due to the requirements of the standard. For example, where the standard has a requirement for a system to be in place to monitor and increase energy efficiency, this could be adapted to include regular reporting and monitoring of energy usage. This data should already be a part of the operation's energy efficiency

management plan, but it is now clear both to the operation that this information needs to be recorded and presented, and can be made clear to the auditor that they should report the changes in energy usage (instead of only reporting that a system is in place).

As a metric standard, the Bonsucro EU Production Standard for sustainable sugarcane[14] presents an example of how the requirements of a standard can be presented in a way that offer greater opportunity for a greater level of data collection from the auditor. The example below in Table 1 illustrates how a criterion to promote energy efficiency uses metric indicators that will require data to be reported by the auditor[15]. Other similar metric information that Bonsucro requires to be collected by the auditor includes crop yield, average price for bagasse exports per tonne, total payroll expenses, training expenses, herbicide application rate and total water applied through irrigation[16] – for an extract from the audit guidance see Annex 1. While this data is collected by the auditor to show compliance with Bonsucro metric standards, there are many ways in which such data could be used to support monitoring and evaluation of impacts. For example, over a period of 5 years this type of data collection may be able to show water use had declined even though crop yield was increasing, or that more money was being spent on training. Analysis of data such as this will be able to be used to demonstrate the impact of both the production itself (i.e. carbon neutral) as well as the impact that certification is having (e.g. more trained workers, less use of herbicides).

Table 1: Extract from Bonsucro EU Production Standard 2011

Criterion	Indicator	Verifier	Standard
5.4 To promote energy efficiency	Total net primary energy usage per kg product	Kj/lg	Total <3000
	Energy used in cane transport per tonne cane transported	Mj/tcane	<50
	Primary energy use per tonne of sugarcane	Mj/t	<300

4.2.2 Strengthening guidelines

Even without changes to the criteria or indicators of a standard, collection of impact data during the audit process could be supported by strengthening the guidelines to clarify expectations for an operation, and increase opportunities for information to be readily available to an audit at the required level of detail. For example, with an indicator on recording accidents, the guidelines would specify that type of accidents should also be detailed.

4.2.3 Specific impact indicators

The standard scheme could also introduce or distinguish specific impact indicators to be reported upon by the auditor as part of a wider scheme impact assessment process. This would be part of a longer-term strategy developed by the scheme, with a clear selection of impacts chosen as critical to the scheme's objectives and information collected over a significant period of time. For some standards distinguishing critical impact indicators in this

[14] Bonsucro EU Production Standard 2011
[15] Bonsucro EU Production Standard 2011
[16] Bonsucro Audit Guidance for the Production Standard, version 3.0 March 2011

way may be useful to both to the operation and the auditors, allowing for clearer and more specific guidance as to what type of data is required. This method would also allow the scheme to introduce a standardised reporting system for these indicators, with this consistency of data potentially bringing greater efficiency and accuracy of data analysis. See Box 2 for an example of the work that FSC is doing in this area.

***Box 2*. Forest Stewardship Council impact indicators**

Several certification schemes are already working to improve and standardise how they measure their impact. The Forest Stewardship Council (FSC) is one example of a scheme working with ISEAL to address how they can use their audit process more effectively to do this. The FSC has been using an indirect method of impact assessment, with the results of audits providing some information about their impact, such as the use of Corrective Action Requests (CARs) as indicators to show where changes or adaptation have needed to be implemented for compliance. However, the FSC will now be introducing 12 additional impact indicators to be reported on by auditors, including biodiversity, ecosystem services, occupational health and safety and sites of special social significance. FSC plans to use this data as part of a worldwide data bank system to measure the impacts of FSC certified forests and progress with their strategy.

(Source: FSC website)

5 Challenges

The following challenges in the auditing processes of sustainability in the biomass field were identified.

Benefits to the certification bodies and auditors

A key challenge to using the audit process to collect impact data is likely to be gaining the support of the auditors and certification bodies themselves. There would be additional training required, changes to existing systems, and depending on what changes are introduced by the standard system there is likely to be additional workload, even if only initially.

However, these changes may also bring longer-term benefits to the auditors and certification bodies. Introducing clearer requirements and guidelines for the reporting of impact data could bring improvements to the audit process, including greater clarity on what is required in reporting and greater efficiency in recording the information that needs to be reported (such as for some indicators reporting quantitative information in a table rather than having to write long paragraphs to explain a situation). The increased reporting of quantitative information could in some instances also help to support claims made by the operation and verify the auditor's observations and decisions, reducing subjectivity and risks of misinformed and inaccurate decisions that will challenge the reputation of the auditor and the certification body.

Suitability of data

As described above (see section 3), only certain types of data will be suitable for collection by the auditor – more likely to be quantitative data - whereas other types will be more suitably collected through other methods such as where professional expertise or wider sampling is needed. The audit process may also not be the most suitable – or reliable – mechanism to collect some types of data (particularly qualitative) due the perceived risk of providing information that will cause negative outcomes[17]. This provides further support to why it is

[17] ISEAL Impacts Code, 9.5 Data Collection Methods

important that the audit process is seen as just one component of a wider and more complex data collection and impact assessment process.

Training

The ISEAL Assurance Code suggests that for competent auditors ongoing training is essential best practice, with it suggested that specific training should be provided by standards system owners on areas including performing sampling tasks and collecting monitoring and evaluation data[18]. This will be particularly important where there are changes by the standard scheme to the audit process requirements or standard requirements, and can be used by the scheme to clarify what is expected from the auditor.

Even with experienced auditors, introductory training from the standard scheme will be needed to introduce and explain the impact assessment programme being implemented and the role of the audit within this, as this is likely to be a new concept even within the scheme itself.

Tools

There may also be data collection tools (particularly digital) able to be used by the auditor that could capture or record certain types data in a way that would require minimal input by the auditor, but that could easily be passed on to the standard scheme. Examples of this include data collected electronically on cameras or mobile devices instead of on paper.

6 Impact assessment tools

6.1 A gradual approach: Screening Exercise and Specialized Impact Assessments

Comprehensive impact assessments can rapidly become cumbersome due to the necessity to outsource specific studies to relevant experts. Cost-effectiveness of impact assessments (IAs) can be improved by adjusting the level of complexity and comprehensiveness of the IA the scale and intensity of operations. In certain cases, operators may not need to conduct an in-depth study of impacts that are potentially irrelevant in a given context. A preliminary screening can avoid unnecessary processes and in-depth studies where irrelevant. . This gradual approach is used by the Roundtable on Sustainable Biofuels (RSB) through its *Screening Exercise* (RSB 2011). It serves as a preliminary step of the impact assessment process and help the operator determining whether an in-depth assessment of certain impacts (e.g. soil, land rights, biodiversity, food security, etc.) is necessary. Conducting an impact assessment is required in the RSB Standard, but the intensity and complexity of the IA will be determined through the screening in the specific context of every operator. The RSB Screening Tool includes different sections, which relate to the environmental and social requirements included in the RSB Principles & Criteria (RSB-STD-01-001): stakeholder consultation, human & labour rights, impacts on local communities, food security, land rights, conservation (biodiversity), soil, water and air.

Whenever the Screening Exercise identifies potential negative impacts of a project, the operator is required to further conduct a specialized impact assessment on the particular impact of concern and implement mitigation measures. Specialised impact assessments can be required after the screening exercise: Social Impact Assessment, Food Security Impact Assessment, Conservation Impact Assessment, Weed Risk Assessment, Soil Impact Assessment, Water Rights and Availability Impact Assessment and Land Rights Assessment.

The RSB developed guidelines for each of these specialised IAs to support operators with the development and implementation of impact assessments and management plans, as described in the next sub-section. At the end of the RSB impact assessment process, operators are required to compile all the results of the screening exercise, specialised impact

[18] ISEAL Assurance Code 2012, 6.3.2 Training, 16

assessments and the implemented or planned mitigation practices in an *Environmental and Social Management Plan* (ESMP). The content and length of the ESMP reflects the intensity and complexity of the impact assessment process. By including impact assessments into its standard, the RSB assures that potential and existing impacts of certified biomass, bioenergy and biofuel projects are adequately addressed, mitigated and monitored. In addition to the impact assessment process and the ESMP, operators will also be evaluated against each and every RSB requirements.

6.2 Guidelines and (Online) Tools

Conducting impact assessments requires a certain level of knowledge and skills in environmental and social sciences, which can prove challenging for operators, or even for practitioners and professionals in impact assessment, whenever a particular topic (e.g. food security, environment services, greenhouse gas, etc.) fall outside of the usual scope of IAs. The following tools are shown as concrete examples of support to economic operators and impact assessment practitioners in the evaluation of environmental and social impacts of biomass, bioenergy and biofuel operations: RSB Guidelines, FAO tools (e.g. the BEFSCI Operator Level Food Security Assessment Tool) and IDB Biofuels Sustainability Scorecard.

The RSB, together with experts, developed specific guidelines for in-depth impact assessments, which are available for biofuel operators, auditors, but also the general public. These guidelines address environmental and social impacts of biomass and biofuel operations, as found in the RSB Principles & Criteria. In addition to background information, these guidelines typically describe the conduction of baseline assessments and guidance on measuring methods, mitigation and monitoring. The following guidelines are currently freely accessible on the RSB website[19]:

- Impact Assessment Guidelines
- ESMP Guidelines
- Rural and Social Development Guidelines
- Food Security Assessment Guidelines (including a Household Survey Questionnaire)
- Conservation Impact Assessment Guidelines
- Soil Impact Assessment Guidelines
- Water Assessment Guidelines
- Guidelines on Water Rights and Social Impacts
- Land Rights Guidelines

The Global Bioenergy Partnership (GBEP) created an online search database for analytical tools to assess and unlock sustainable bioenergy potential.[20] It primarily provides decision-makers with information on relevant tools for spatial planning, technical and implementation options, stakeholder engagement, assessment tools, mitigation practices, and certification standards.

FAO's Bioenergy and Food Security Criteria and Indicators (BEFSCI) project compiled a list of "tools and methodologies that can be used to inform the development of a sustainable bioenergy sector and of sustainable operations, and to assess, both, *ex-ante* and *ex-post*, the main environmental and socio-economic impacts arising from individual operations or from the bioenergy sector as a whole."[21] These tools are useful as information source and for the implementation of impact assessments. The target audience are mainly operators and governments, but also interested stakeholders. Tools and methodologies on socio-economic

[19] RSB website: www.rsb.org
[20] GBEP online tool: http://www.globalbioenergy.org/toolkit/analytical-tools/en/
[21] BEFSCI website: http://www.fao.org/bioenergy/foodsecurity/befsci/tools/en/

impacts include, for example, the Human and Energy Development Index or the Computable General Equilibrium Modelling of Economy-Wide Impacts of Bioenergy Development (see the table 1 for the full list or the report "Compilation of Tools and Methodologies to Assess the Sustainability of Modern Bioenergy").[22]

Table 2: Socio-economic tools and methodologies, compiled by BEFSCI, 2012

	Primary Users		Type	
	Governments	Operators	Planning	Monitoring
LOCAL FOOD SECURITY				
Household Welfare Impact Analysis	√		√	√
Integrated Food Security Phase Classification (IPC)	√		√	√
Operator Level Food Security Assessment Tool	√	√	√	√
COMMUNITY DEVELOPMENT				
Human Development Index (HDI)	√	√	√	√
ENERGY SECURITY AND LOCAL ACCESS TO ENERGY				
Energy Development Index (EDI)	√		√	√
Herfindahl-Hirschman Index	√	√	√	√
GENDER EQUITY				
Gender-Related Development Index (GDI)	√	√	√	√
CROSS-CUTTING (including employment, wages, income and smallholders inclusion)				
BEFS - Computable General Equilibrium (CGE) Modelling of Economy-Wide Impacts of Bioenergy Development	√		√	√
Biomass Socio-Economic Multiplier (BIOSEM)	√	√	√	
Global Trade Analysis Project (GTAP) Model and Database	√		√	
Partial Equilibrium (PE) Models: AGLINK-COSIMO and OECD/FAO Agricultural Outlook	√		√	
Process Engineering for Environmental and Techno-economic Analysis (PENTA); Bioenergy Techno-economic Analysis for Africa (BIOTA)	√	√	√	√

[22] BEFSCI (Elizabeth Beall, Paola Cadoni, and Andrea Rossi, ed.): A Compilation of Tools and Methodologies to Assess the Sustainability of Modern Bioenergy, 2012: http://www.fao.org/docrep/015/i2598e/i2598e.pdf;or Two-page overview of the report: http://www.fao.org/bioenergy/31473-0b5d5cbe40d63d9fd44a24eb4876bf38a.pdf

In addition, BEFSCI has developed the "Operator Level Food Security Assessment Tool", which addresses food security through the following aspects: change in the domestic supply of food; availability and efficiency of used resources; and "physical displacement, change in access to resources, compensation and income generation."[23] Operators enter their data into the tool, which includes indicators on environmental and socio-economic aspects directly related to food security. A scoring system provides users with a "preliminary indication of potential risks and benefits for food security from the operation."[24] The results can also be downloaded and saved for later use, e.g. for monitoring purposes.

Finally, the Inter-American Development Bank (IDB) has designed the IDB Biofuels Sustainability Scorecard, which is freely available online.[25] The scorecard is based on the RSB sustainability criteria and has the main objective "to encourage higher levels of sustainability in biofuels projects by providing a tool to think through the range of complex issues associated with biofuels."[26] The Scorecard is not seen as a substitute for certification or life-cycle assessment tools, but rather as an add-on that provides information and supports the process. Therefore, the primary users are project developers from the private sector, who can use it at the project level, but the Scorecard could also be used more widely in the assessment of biofuels development. The Scorecard covers mostly environmental and social sustainability issues, but according to the IDB, also its Environment and Safeguards Compliance Policy,[27] national regulatory frameworks for biofuels and the economic sustainability have to be evaluated and taken into account when planning and implementing a biofuel project.

7 Monitoring and Management Plans

While they cannot directly be called *tools*, management plans and monitoring mechanisms are still closely linked to impact assessments, and the success in establishing sustainability will also depend on their proper design and implementation. The management plan, e.g. an Environmental and Social Management Plan (ESMP), should reflect the outcomes of the impact assessment, define in detail how impacts will be mitigated, and finally lay down a monitoring procedure, which evaluates the effectiveness of mitigation measures and feeds back into an improved system.

The mitigation practices depend on the specific risks and topics of the project, e.g. in food insecure regions, the operator could set aside land for local communities to grow food and support them by providing seeds and technology. The mitigation strategy should be included in an ESMP or special management plan for the particular issue.

The effectiveness of mitigation measures in achieving sustainable operations can be assessed through periodic reviews of progress towards the initial aims, as set in the management plan or impact assessment reports. Therefore, monitoring and feedback mechanisms need to be integrated in the management plan, in relation to mitigation practices.

Baseline surveys undertaken during the early stage of impact assessments can as well be used for monitoring the effectiveness of the management plan. Improvements can be measured over time against this baseline. Depending on the size and intensity of the project, reviews shall ideally be conducted every 3 to 5 years. It is also advisable to have smaller

[23] Website of BEFSCI Operator Level Food Security Assessment Tool: http://www.fao.org/bioenergy/foodsecurity/befs/operator-tool/en/
[24] Idem.
[25] IDB Biofuels Sustainability Scorecard: http://www.iadb.org/biofuelsscorecard/scorecard.cfm?language=English
[26] See website of IDB Biofuels Sustainability Scorecard: http://www.iadb.org/biofuelsscorecard/
[27] IDB's Environment and Safeguards Compliance Policy, 2006: http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=1481950

sentinel monitoring studies, meetings with local stakeholders or other assessments in between the impact assessments to verify that no major negative impacts are overseen or mitigation actions lead to a contrary effect. Feedback from monitoring can then lead to an adaptation of mitigation or enhancement measures and result in a better overall management.

8 Manuals on Good Practices

The FAO has developed several good practice manuals through the BEFS project. There is, for example, one publication on good socio-economic practices, which addresses the following main relevant topics in connection with bioenergy:[28]

- Land access,
- Employment, wages and labour conditions,
- Income generation and smallholder inclusion,
- Local food security,
- Community development,
- Energy security and local access to energy, and
- Gender equity.

For each of these dimensions the manual presents good practices for biofuel producers, which were identified through field surveys of bioenergy producers by BEFSCI. For example, on promoting income generation and facilitating the inclusion of smallholders, the report mentions having contracts with local goods and service providers, providing access to credits, include conflict resolution mechanisms and others.

Another manual by BEFSCI is called “Policy Instruments to Promote Good Practices in Bioenergy Feedstock Production”.[29] While the other guide is rather aimed at biofuel operators, this manual is more aimed at policy- and decision-makers. BEFSCI acknowledged that the implementation of good practices, as described in the other manuals, might face challenges and (non-)economic obstacles without the proper policy instruments in place. Thus, “a range of policy instruments that can be used to require or promote – either directly or indirectly – good environmental and socio-economic practices in bioenergy feedstock production, and to discourage bad practices”[30] were compiled. There are four main clusters of instruments:

- Mandates with sustainability requirements – such as the US Renewable Fuel Standard or UK Renewable Transport Fuel Obligation,
- National standards for certification – such as the Indonesian Sustainable Palm Oil System,
- Financial incentives – such as direct payments, tax credits, payments for Environmental Services or grants, and
- Capacity building – programs exist e.g. in Brazil or Vietnam.

[28] Website of BEFS: http://www.fao.org/bioenergy/foodsecurity/befsci/gpse/en/ and Manual: Elizabeth Beall/Andrea Rossi. Good Socio-Economic Practices in Modern Bioenergy Production. Minimizing Risks and Increasing Opportunities for Food Security, FAO 2011 (http://www.fao.org/docrep/015/i2507e/i2507e00.pdf).
[29] Andrea Rossi and Paola Cadoni: Policy Instruments to Promote Good Practices in Bioenergy Feedstock Production, FAO 2012 (http://www.fao.org/docrep/015/i2617e/i2617e00.pdf).
[30] BEFSCI website: http://www.fao.org/bioenergy/foodsecurity/befsci/instruments/en/

9 Capacity Building and Trainings

Sustainability requirements for biomass, bioenergy and biofuel operators cover a wide array of issues, some of them embedding a considerable level of complexity. Understanding socio-economic issues related to livelihood improvements, food security, water use, land rights, etc. is not easy for most economic operators, especially small producers in emerging countries. Not only shall operators have a basic understanding of potential socio-economic impacts of biomass, bioenergy and biofuel production, appropriate to scale and intensity, but they shall also receive clear guidance on how to best address those in a cost-effective way.

Written guidelines published by governments or standard systems (see above) can be instrumental in explaining in detail what operators are expected to do. Nevertheless, the lack of knowledge or understanding of socio-economic issues and related solutions can be addressed even more efficiently through the implementation of capacity building and training activities among farmers, plantation owners, plant managers, staff and other stakeholders concerned with the development and execution of biomass, bioenergy and biofuel operations.

Training and capacity building programs are generally developed and implemented by specialised companies, governments, local authorities or non-governmental organisations, or a combination of several actors, as described below.

9.1 An example of multi-stakeholder capacity building program: SCAN

Intergovernmental organisations can play an important role in capacity building and training, as illustrated through the Sustainable Commodity Initiative (SCI), which gathers the UN Conference on Trade and Development (UNCTAD), the International Institute for Sustainable Development (IISD) and several other organisations. SCI is implementing specific platforms such as the Sustainable Commodity Assistance Network (SCAN)[31].

SCAN is a capacity building program “aimed at providing customized, needs-based technical assistance to producers wishing to adopt sustainable practices and enter sustainable markets.” It is particularly relevant for small producers in the developing world, who are willing to access sustainability standards and markets for certified goods.

SCAN is led by a multi-stakeholder advisory board, which gathers a large number of organisations, such as the UN Development Program (UNDP), UNCTAD, CABI, the ISEAL Alliance, Fairtrade and The Rainforest Alliance among other standard organisations.

Through its technical committee and in partnership with local partners, SCAN contributes to building curriculums for local producers, appropriate to the local context and the level of organisation of existing groups. The curriculum offers a wide range of training elements such as:

- Good agricultural practices
- Compliance with standards
- Organizational development
- Internal control and quality management
- Product development and marketing
- Financial planning
- Risk management.

A pilot phase of the program was successfully implemented in Peru, Vietnam and Tanzania, with a specific focus on coffee. Future prospects include other commodities such as cocoa,

[31] Website of the Sustainable Commodity Initiative on SCAN: http://sustainablecommodities.org/scan

tea and banana. This approach could also serve as an example for developing a training course for biofuels and bioenergy.

The other programs developed by the SCI are the Committee on Sustainability Assessment (COSA)[32], which is rather oriented towards measuring and monitoring impacts, and the Finance Alliance for Sustainable Trade (FAST)[33], which enhances access of producers to trade.

9.2 Standard-related training in the context of biomass, bioenergy and biofuels

In the specific context of compliance with sustainability requirements related to socio-economic impacts, standard or certification systems may offer training for economic operators. This is for example the case of the Forest Stewardship Council (FSC)[34], the Rainforest Alliance[35], and the RSB. Some training programs are primarily designed for auditors willing to receive accreditation to perform certification audits, but these are also open to other practitioners willing to understand the requirements in the standard and certification system.

These training programs are usually effective in bringing operators and auditors to the required level of understanding and capacity but they turn inherently restrictive if limited to online platforms or in-person courses in a pre-determined location. In both cases, smaller operators in the developing world would likely not be able to access training. So, while current training programs are supposedly appropriate for large companies, it is incumbent on standard and certification schemes to develop solutions to reach out to smaller operators through adapted programs, which do not require financial means or technologies beyond the reach of the concerned operators. This means that local face-to-face capacity building and training programs are required to offer a real opportunity to every operator.

Several limitations exist to the development of such local training programs, the main one being its cost. Not only does the development and implementation of such program require considerable financial means, but nor does it generate any significant revenue, given the limited capacities of participants to pay for it. This lack of immediate financial benefit could possibly be balanced through the licensing fees collected among certified operators. However, few standard and certification systems are sufficiently well off to afford implementing such program. In the domain of biomass, bioenergy and biofuels, capacity building programs would hence rely on grants and donations from governments, foundations or companies. Larger companies might include capacity building as part of a contractual agreement with groups of operators willing to mainstream their production into the supply chain of an important economic operator.

[32] Website of Committee on Sustainability Assessment (COSA): http://www.thecosa.org/
[33] Website of the Sustainable Commodity Initiative on FAST; http://sustainablecommodities.org/fast
[34] Website of Forest Stewardship Council: http://www.fsc-uk.org/?page_id=68
[35] Website of Rainforest Alliance: http://www.rainforest-alliance.org/agriculture/training

10 Conclusion

Using the audit process as a form of collecting impact information data presents a valuable opportunity for sustainability schemes to build on existing procedures. While the audit process can only be one part of a larger impact data collection process, implemented by the scheme as part of the impact assessment programme, it represents a large potential source of information that is available to the scheme and needs to be recognised as a part of this programme.

It is likely that existing schemes will need to introduce changes gradually, starting with changes to the audit process requirements and possibly later introducing changes to the standard itself. These changes could range from relatively minor adaptations such as clarifications or specifications, to larger-scale such as introducing new impact indicators to be reported on.

Adaptations in this area could also bring other general benefits to the scheme, including greater clarity for both the operation and the auditor on what information is required and how it should be reported. There are also opportunities for the scheme to achieve a higher level of consistency in information that is being reported to them, and that then can be more efficiently used by the scheme.

In the second part of this report, practical tools were presented that can be used to identify, measure, and mitigate potential socio-economic impacts: impact assessment tools (screening exercise, guidelines and special online tools); manuals on good practices; monitoring and management plans; and capacity building and trainings. Each of these tools comes with pros and cons, but their interest precisely resides in their complementarity and the variety of use one can make out of these, with regards to a specific situation or context. Biomass, bioenergy and biofuel operations may vary greatly in terms of size, location, production pattern, legal framework, etc. Therefore, it is important for operators to be able to use the most appropriate tool in each specific context. These tools can then become more widely adapted and implemented in international policies and standards.

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Roundtable on Sustainable Biofuels (RSB): www.rsb.org

The Sustainable Commodity Initiative: http://sustainablecommodities.org

12 Annex 1: Extract from Bonsucro Audit Guidance for the Production Standard, 2011

BONSUCRO™
BETTER SUGAR CANE INITIATIVE

APPENDIX 1: DATA REQUIRED FOR MILLING/PROCESSING AND AGRICULTURE

General information:

1. Profile - description of unit, its boundaries and activities
2. Summary - key environmental, economic and social issues
3. Vision and strategy - Action plans and targets
4. Policy and organization - management structure, stakeholder interactions, compliance with compulsory and optional standards.
5. Performance data - input values for calculation of processing metrics, and input data for calculation of net energy usage and GHG emissions.

Below is listed all data necessary to make a complete assessment of compliance with the Bonsucro metric standards. Highlighted fields are to be completed, to replace the sample data shown. (Note currency unit can be chosen, and will normally be that of the country involved).

Sugarcane processed	1600000	tonnes
Fibre content of cane	14.0	%
Sucrose content of cane	13.0	%
Total sugars content of cane expressed as reducing sugars (ART)	14.5	%
OR Reducing sugar / sucrose ratio in cane or raw juice	5.0	%
Raw juice purity	85.0	%
Sugar production	180000	tonnes
Production of white refined sugar	72000	tonnes
Ethanol production	14.00	ML
Molasses produced	1	tonnes
Others products produced	0	tonnes
Molasses exported	0	tonne
Average price for molasses exports per tonne	80	£ / t
TSAI content of molasses sold	48.0	%
Power exported per year	10	GWh